# The Physician's Magazine

QUARTERLY. AUGUST, 1885. VOL. I.—NO. 1

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Entered at the Post Office at Philadelphia as second-class matter.

FOOTE & SWIFT, Publishers, 1539 Chestnut Street, Philadelphia.

*Subscription Price per Annum*, . . . . . $1.00
*Single Copies*, . . . . . .30

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## ONE SUBSCRIBER WANTED.

WE ask your subscription, not as a favor, but because we offer you that which is full value for your money. To place our request on any other basis, would be to show disrespect to the writers whose names appear in our List of Contributors. We believe that any one of them is capable of writing a single article, worth the price of a year's subscription to any reader. We have contracted with them to furnish the best they can produce. We offer to contract to supply you, in consideration of ONE DOLLAR paid in advance, with a Quarterly Magazine for one year, containing their articles.

Our Prospectus, the articles produced in this number, the contributions announced to appear in future issues, together with the List of Contributors, show the character of THE PHYSICIAN'S MAGAZINE and guarantee its value.

We know that the market valuation for articles is not their full *worth*, any more than one dollar is the full cost of the Magazine in which they are printed. The value of an *idea* is of that rare and subtle quality which increases with use and is multiplied by the number among whom it is distributed.

Commercially, we can offer contributors all they can obtain elsewhere for their articles. We wish to offer more. We wish to offer the inspiration flowing from the knowledge that, when they write for THE PHYSICIAN'S MAGAZINE, they address every physician in the United States. This we cannot do if you do not subscribe. Can you afford to weaken the therapeutic value of such an inspiration, and deprive yourself from being benefited by the articles produced by it?

## PROFESSIONAL INFORMATION WANTED.

DR. J. WILLIAM WHITE, after reading a paper before the Philadelphia County Medical Society, on "The Treatment of Gonorrhœa," * said:

"I wish to mention a point on which I should like the opinion of the Society, and that is in regard to the use, in chronic urethral troubles, of the so-called soluble bougies, particularly with reference to those made by Messrs. Foote & Swift, under the name of Vectores. I have given them a careful trial, but am unable, as yet, to pronounce an absolutely positive opinion. Theoretically, they certainly should be useful, but when I have expected good effects they have often seemed to be irritating. They cannot be diluted as an injection can. I had some of these made with cocaine, and have used them before performing urethral operations, such as the removal of urethral polypi and internal urethrotomy. I find that simply dipping them in water does not permit of their ready entrance into the urethra, and, if they are oiled, one of the advantages alleged—that the remedy comes directly in contact with the tissue—is destroyed. It seems to me, however, that there are possibilities of excellent results from their employment, and I should like to have the experience of the Society."

Another call for Professional Information comes from Dr. A. F. Reed, of Holyoke, Mass., who writes:

"I would suggest that you ask some Physician who is familiar with the use of your Vectores, to write for a Medical Journal an article describing their use and giving the selections made for different conditions and stages of disease. I have just cured a case of gleet, after some experiments, but should prefer to have some recorded experience to govern future use."

These calls for information express the wish of many others, and illustrate the deep interest felt in the subject. To meet this demand, we invite all Physicians who have used Swift's Vectores, to write us the result of their experience and observations, and to make practical suggestions for the improvement of their manufacture.

In making this request of the Profession, we wish it understood, that reports of unfavorable results, which mark the limitations of their use, as well as of favorable results, which show where they may be used to best advantage, are equally serviceable. We are engaged in a revision of our Formula List, with the object of taking advantage of all that has been learned regarding them.

A new method of preparing remedies for making local applications, if a radical improvement upon methods that have been long in

* *New York Medical Journal*, May 9, 1885, p. 534.

use, necessarily requires a large amount of patient investigation and comparison of results before its sphere of uses can be fully determined. Such was the price paid by others for the old methods. Such is the price we must pay for our new method. A method has definite principles, we will say a soul of its own. It must be tested in accord with these principles, to do which requires a good understanding of them, or its soul cannot be saved; that is, the best it is capable of cannot be realized.

It is easy to understand why formulæ, originally written for certain methods of preparation or application, or by those whose experience has been entirely with such methods, are not applicable to a radically different one.

In making a revision of our Formula List, the points to be considered are: the local therapeutical value of each ingredient, and the proper strength of the formula; also, to see that chemical incompatibles are not included in the same formula.

Professor D. Hayes Agnew and Dr. J. William White, of Philadelphia; Professor Fessenden N. Otis, of New York, and Dr. W. H. Heath, of Buffalo, were among the first to suggest that a formula, to be prepared in a mass without cocoa butter or gelatin, should be of less strength than one in which these vehicles are used. This will also be proven to be true, regarding formulæ prepared in our new method, compared with those in which water or liquids are used as the vehicle.

Upon this point, Professor Fessenden N. Otis, of New York, writes:

"The proportion of Acet. of Lead should not be greater than three grains to the ounce of the mass. Great damage is capable of being caused by the Vectores being made of such strength as you have them. My associate, Dr. Bangs, has had unfavorable results from your preparation of resorcine. None of the Vectores should contain more of any material than would be proper for the strength of an injection to be used for the same purpose."

Physicians will keep in mind the fact that the mass can be made of any strength they prescribe and that our formulæ are all printed as written by Physicians.

With regard to oiling the Suppository to facilitate introduction, Dr. G. Granville Faught, of Philadelphia, says:

"When making applications to the third section of the male urethra, I have lightly coated the Suppository with oil of sweet almond. I find that it not only caused the Vector to pass easily, but that the oil was taken off sufficiently by the membrane in the passage, to prevent it from interfering with the action of the Suppository; also, that the oil prevented the medication of the anterior portion of the urethra."

We repeat our request for suggestions from all Physicians who have used Swift's Vectores, and respectfully ask attention to the following letters, which have been written

## FOR THE INFORMATION OF THE PROFESSION:

During the past six months I have used Swift's Vectores in the treatment of Acute and Chronic Gonorrhœa. I consider the device par excellence for the treatment of this disease, especially in its latter stages. I had a case that was intractable to all internal or topical treatment, until I used the Vectores, when my patient reported an improvement at once, and continued so until all traces of the disease disappeared.

I can, with confidence, assure my patients, that if they submit to a circumscribed mode of living, I can cure the affection in ten (10) days.

P. HERMANY, M. D., Mahanoy City, Pa.

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I find Swift's Vectores valuable if intelligently used. I think they are, as a rule, left in place too long a time. Those composed of Iodoform and Resorcine, formula XVII., are useful in the treatment of endo-cervicitis. I find them beneficial in Chronic Nasal Catarrh also. In Granular Inflammation of the Urethra, those containing Nitrate of Silver or Morphia, formulæ XIV. and XV. are good. The precaution should be taken of passing them down to the diseased spot through a soft rubber catheter, with the end cut off.

W. S. TREMAINE, M. D.
449 Washington Street Buffalo, N. Y.

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I have been using Swift's Vectores for some time in making applications to the interior of the Uterus. They have fully filled my expectations, and I heartily recommend them. I am in the habit of allowing them to remain for from *three to five minutes* in the cavity of the Uterus.

The formulæ I have mostly used are Nos. XXV. and XXVI. I am satisfied that when they become known to the Profession, the old-fashioned cotton swab will be thrown aside.

EUGENE P. BERNARDY,
221 South Seventeenth Street, Philadelphia.

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I use Swift's Vectores with Formulæ Nos. I. and II. in granulation of cervix with profuse monthly flow. Nos. IX. and XIII. have been most serviceable in catarrhal inflammation with leucorrhœa. Nos. XVII. and XXXIV. in membranous dysmenorrhœa, No. XXVI. in hypertrophy of cervix.

I leave the Suppository in place from *three* to *five* minutes, or until the dissolved medication oozes from the cervix. One Suppository will make from *two* to *three* applications. After using, I always dry the Suppository, label it with the patient's name and wrap in oiled paper. I never use the same Suppository for different patients.

I regard one or two applications per week as sufficient, avoiding at least three days before and after the monthly period. N. K. MORRIS, M. D., Denver, Col.

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I have used Swift's Vectores in a variety of cases, and am happy to state that the result has been *very* satisfactory. The formula will at once suggest the disease to which it is the most applicable, and the application can be made much more efficient than in the old way. The frequency and length of time that the Vector should be left in the Uterus must be determined by the Physician. I have used several of the different formulæ, and can state with pleasure to the profession that the result has been *good*

E. J. ROTHWELL, M. D., Denver, Col

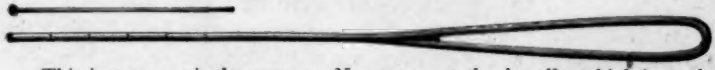
## SWIFT'S ADJUSTABLE HOLDERS.

No. 4. Long. Length, 9 inches. Size, No. 8, French scale.

This instrument is made of tough, flexible metal, nickel-plated, highly polished, graduated in half-inch spaces.

The handle is 4 inches long, finished in black jet enamel.

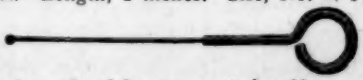
No. 5. Long. Length, 9 inches. Size, No. 8, French scale.



This instrument is the same as No. 4 except the handle, which is made in *one piece* with the instrument. It is formed by making a loop of the metal 4 inches long, and clasping the end and arm together with a cap filled with solder.

This style of handle is the most substantial possible. The instrument and handle are nickel-plated and highly polished.

No. 6. Short. Length, 2 inches. Size, No. 8. French scale.



This instrument is made of the same metal as Nos. 4 and 5, and is plated and polished in the same manner.

### ADJUSTABILITY.

These instruments all have an inset screw one-quarter inch in depth, of uniform gauge, and cut on a scale of 68 threads to the inch. Tips for numerous uses can be attached to the instruments by means of this screw. The same Tip can be used with a Long or Short Holder at pleasure, thus virtually doubling the range of uses.

### SWIFT'S ADJUSTABLE TIPS.

Flexible. Length, 2¾ inches. Size, No. 5, French scale. Bulb, No. 7½, French scale.

These Tips are made of soft copper, finished with white plating. This plating will not scale off, and will resist the action of acids perfectly for all practicable requirements. They are of uniform gauge. The screw for attaching them to the Holders is one-quarter of an inch in length and is cut on a scale of 68 threads to the inch, corresponding with the thread in the Holder.*

The bulb is formed from the solid metal.

### ADAPTABILITY.

These Holders and Tips are adaptable to such various operations, they can be said to be universally useful. One marked feature of the Tip is, that on account of its small cost—but two cents—a physician can afford to twist,

* Sometimes the plating fills the threads, making it a little difficult to attach the Tip the first time it is used. After it has been entered once, it will always work freely.

cut or notch it in any way desired, to adapt it to a special use, or destroy one for an operation. In the hands of a physician having good mechanical skill, these Holders and Tips can be made to do the work of a large number of expensive instruments. Again, as any physician can afford a new Tip whenever an old one becomes undesirable, he need not buy silver, aluminum or platinum.

In short, they decrease expense for instruments, save weight and space, save time and care, and in an unforeseen emergency, are easily adapted to many uses.

## SOME ADAPTATIONS.

1. *As a Flexible Uterine Sound.* When attached to the Long Holders, the Tip extension furnishes the uterine gauge of two and one-half inches. The graduated scale on the Holder indicates the depth of an insertion, while the flat of the looped handle or a mark easily made on the jet handle, indicates the direction.

The Tip can be given any curvature desired.

2. *As a Flexible Applicator.* For this purpose, when desired, the Tips can be barbed with an ordinary knife, or if used smooth, the bulb may be cut off to facilitate removing the cotton. Wads may be prepared upon a number of Tips in any desired shape, and used in place of brushes, etc., etc.

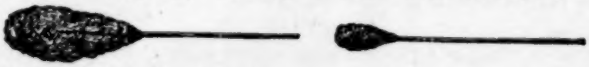


Again, after using, Tips can be thrown aside, if operations are hurried, until a convenient time to cleanse and disinfect them. Or, a Tip can be kept fixed in a Holder and the wad can be wound on and stripped off for each operation the same as in the case of any ordinary applicator.

With the *Long Holders* they can be used in the *Throat, Uterus, Male Urethra*, or any deep cavity.

With the *Short Holder* they can be used in the *Eye, Ear, Anterior Nasal Cavities, Female Urethra, Anterior Male Urethra*, or any shallow cavity.

3. *As a Sponge Holder* for use in small cavities, especially the *ear*, or for general use when necessary to extemporize something for that purpose.



A piece of sponge, varying from very small to one of considerable size, can be firmly attached to a Tip with ordinary sealing wax. In doing this the Tip should be heated first, the wax dropped on it and the sponge pressed into the hot wax. To remove the sponge, heat the Tip.

4. *As a Blunt Curette*, by bending a Tip into a round or oblong loop.

These curettes may be made on the instant; or, a physician can shape them at his leisure, to suit his own idea and carry them in his pocket case ready for use.

5. *As a Hook*, with or without the bulb.

The surgical uses of a hook are too numerous and too well understood to require any description. The ease with which a Tip can be converted into a hook is apparent.

Other adaptations for these Tips will readily suggest themselves to every physician using them.

The models for the above illustrations were made from straight Tips, with the aid of a pen-holder, pocket knife and hammer, a spirit lamp and sealing wax.

Other Tips, adapted for permanent or variable uses, will be manufactured from time to time, and supplied at extremely low prices to physicians having these Holders. We will also manufacture Tips to order from special patterns.

## PRICE.

The advantages of these Holders and Tips have been immediately recognized by every one of a large number of physicians. We have adopted a selling price named by them, at which, in their opinion, every physician will buy *at once*, without entailing on us the expense of special advertising or solicitation. We have manufactured in one lot enough Holders and Tips to supply nearly every physician in the United States, in order to offer them at the price named.

## A SET COMPRISES

*1 Adjustable Holder, Long, No. 4 or 5.*
*1 " " Short, No. 6.*
*10 Adjustable Flexible Tips.*
} PRICE, $1.00.

WE WILL SEND THIS SET COMPLETE, POSTAGE PAID, ON RECEIPT OF ONE DOLLAR; EXTRA TIPS, TWO CENTS EACH.

In ordering, be sure to state which of the Long Holders, *No. 4 or No. 5*, is wanted.

## A GUARANTEE OF SATISFACTION.

We agree to refund the money to any physician not satisfied with the set of Holders and Tips, who will return them to us within one month after receiving the same.

FOOTE & SWIFT,

1539 Chestnut Street, Philadelphia.

# Book Notices.

I. MODERN MEDICAL THERAPEUTICS.—A Compendium of Recent Formulæ and Specific Therapeutical Directions, from the practice of eminent contemporary physicians, American and foreign. By George H. Napheys, A. M., M. D. Eighth Edition. (1885.) Edited by Joseph F. Edwards, M. D., and D. G. Brinton, M. D. One volume, 8vo. pp. 629. Price, Cloth, $4.00; Sheep, $5.00.

II. MODERN SURGICAL THERAPEUTICS.—A Compendium of Current Formulæ, Approved Dressings and Specific Methods for the Treatment of Surgical Diseases and injuries. By George H. Napheys, A. M., M. D. Seventh Edition. One volume, 8vo, pp. 608. Price, Cloth, $4.00; Sheep, $5.00.

III. THERAPEUTICS OF GYNÆCOLOGY AND OBSTETRICS.—Edited by William B. Atkinson, M. D., etc. Second Edition. Greatly Enlarged. One volume, 8vo. Price, Cloth, $4.00; Sheep, $5.00.

IV. THERAPEUTICS OF DISEASES OF CHILDREN.—With remarks on the Hygiene of Infancy. By Joseph F. Edwards, M. D., etc. Just Issued. (1885). One volume, Cloth, 8vo, pp. 376. Price, Cloth, $3.00; Sheep, $3.50.

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The above series of works are of that practical, every-day character, that they are sure not to get dusty on the shelf, but to be turned to, daily, for advice and consultation. They are, indeed, a library in themselves, representing, as they do, the matured advice of several hundred of our most distinguished contemporaries, on the treatment of disease. They are not mere formalaries, as they embrace whatever therapeutic resources the active investigations of modern science have placed at the command of physicians, such as mineral waters, diet cures, electricity, travel and climate, etc., etc. As will be seen, most of the volumes have undergone quite recent revision, and all represent the therapeutics of the last five years.

The increase of new remedies, which has been one of the leading features in the development of pharmaceutical science in the last few years, renders such a series of compendiums as the above almost indispensable to the physician who would learn which of these have solid claims upon his attention. The vast fields of antiseptics come in for a full discussion in the volume on "Surgical Therapeutics" and in the lately-edited eighth edition of the "Medical Therapeutics." Their application to the treatment of consumption and a number of other diseases is set forth with much minuteness.

Most works which profess to treat of therapeutics approach the subject from the druggist's point of view. They give a list of drugs and proceed to speak of their application. But these volumes take up the topic as the physician wants it handled. The headings are those of the disease or injury,

and all the valuable means to relieve or control it which have of recent years been advocated by the best authorities in the profession are mentioned, with full directions for their employment. The advantages of this plan of presenting the subject will be manifest to all readers.

There is, in some quarters, a tendency to underrate the value of definite formulæ; but we are quite decidedly of opinion that the success or failure of a remedy often depends on the character of the combination in which it is exhibited, on the size and frequency of the dose, and on its association with synergics. These points are precisely those to which the editors of these volumes have given particular attention, and on which they are specially instructive.

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HAY FEVER AND ITS SUCCESSFUL TREATMENT. By Charles E. Sajous, M. D., etc. Thirteen wood-engravings. Philadelphia. F. A. Davis, attorney, 1217 Filbert Street. 1885. pp. 104.

This is a beautifully-printed work of about 18,000 words, setting forth the cure of Hay Fever by a superficial and sometimes profound organic alteration of the nasal mucous membranes which removes the hyperæsthesia by

1. Caustic Nitric Acid.
2. Caustic Chromic Acid.
3. Caustic Glacial Acetic Acid.
4. Galvano-Cautery.
5. Galvanic Caustic Snare.
6. Cold Wire Snare.

On page 9, the writer names three factors essential to Hay Fever:

1. *An External Irritant.*
2. *A predisposition of the system to become influenced by this irritant.*
3. *A vulnerable or sensitive area through which the system becomes influenced by the irritant.*

This reconciles, the author thinks, the pollen, the neurosis, and the local disease theories, advanced by writers on the subject, and found in the literature of the profession.

It is something refreshing to have so clear a statement of the causes of this disease, and certainly it is evident that if either one of the three factors be removed, the Hay Fever is removed, or falls, like a three-legged stool when one leg is taken away. What our author has done is to remove the third leg of his stool by safely rendering asensitive, the hyperæsthetic area which the irritant influences. The procedures as described at length and reported by the author and others, have been successful. For example, the case of Mr. M., a subject of Hay Fever for forty-two years, is known to the writer, and his cure is certainly a test case and recommendation enough for the plans here named. The cauterization was superficial, not profound.

On pp. 56, 57, etc., we find full details of the process of removing the nasal tissues when hypertrophied.

This is certainly a radical, surgical procedure. The patient must choose between a loss of his substance and the disease. When it is generally understood how tolerant the nose, and indeed the whole face, is to dislocations, fractures, surgical treatment, and removal even of its bony structures and coverings, those who have Hay Fever will have less hesitation probably in resorting to these procedures for relief, the more so as on page 96, our author says that the sense of smell instead of being obtunded, is often improved. There are no unsuccessful cases reported by our author.

As Hay Fever has now become of importance enough to have regularly organized societies of the sufferers study the treatment, especially at mountain resorts, Dr. Sajous has a good chance for a fair hearing, and time must show the value of this mode of treatment. Certainly the disease has been one of the opprobia of medicine, and any one who has discovered and brought to notice such a changed and hopeful condition of things as Dr. Sajous has, deserves and will receive the highest praise.

The kinship of asthma to Hay Fever is touched on in the work. We are glad to see it mentioned, for we regard Hay Fever as simply a form of asthma with a local development by irritation of the hyperæsthetic nasal mucous membrane, because a study by the writer, of the morphology of the sputa between the paroxysms, in about ninety cases of Hay Fever has shown it to be the same as the morphology of asthmatic sputum, and because we have seen Hay Fever cured by medical treatment addressed to the digestive organs, which removes the peculiar morphology of the sputum, and leaves no irritant to make the nasal mucous membrane hyperæsthetic.

This mode of treatment may be compared to making a gun harmless by drawing the charge, while the effort reviewed here is the same as rendering the gun harmless by making responseless the trigger.

As things now are, this essay of Dr. Sajous is the foremost published contribution on the subject, and as such it will stand until something better is offered; but for those that prefer thus removing Hay Fever by taking away its "pou sto," it is quite unlikely that anything more scientific or effective will ever be offered in the form of topical interference.

*New York, July 17, 1885.* EPHRAIM CUTTER.

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[In Press.]

Official Formulæ of American Hospitals. Price, $1.00. Published by *The Medical World*, Philadelphia.

This publication will be ready for delivery in a few weeks. It presents, in a convenient form, a collection of the formulæ most used in the principal hospitals of this country. Such a hand-book is of more value to the busy practitioner than are many ponderous volumes issued at ten times its cost. This is one of the instances where *worth* and *cost* bear no relation to each other.

# THE PRINCIPLES GOVERNING A CHOICE OF CURRENT IN ELECTRO-THERAPEUTICS.*

By G. Betton Massey, M. D.

[Electro-therapeutist to the Philadelphia Orthopædic Hospital and Infirmary for Nervous Diseases. Member of the American Neurological Association; of the Philadelphia Neurological Society; of the Franklin Institute, etc., etc.]

WHEN a physician resolves to use electricity as a remedial agent in a given case, he is at once confronted by the questions: Shall galvanism, faradism or franklinism be used; or will either do? Does one form of current promise greater success with this case than another?

It is possible that the answers that occur to him to these eminently practical questions are somewhat hazy, and he justly blames himself for a lack of definite knowledge on the subject. After trying a galvanic battery, and possibly finding it out of order, he will fall back on the faradic battery as the most convenient and handy. The result is naturally commensurate with the wisdom displayed.

A diligent study of the literature of the subject would throw much light upon the questions that vex him, yet it is doubtful if most authorities are sufficiently definite in the statement of their conclusions to leave a clear impress upon the mind. This probably arises from a lack of boldness in their treatment of the preliminary subject of

### THE DIFFERENTIAL PHYSICAL CHARACTER OF CURRENTS.

The several currents used in medicine are so essentially different in their characters and actions—especially galvanism and faradism—that from the point of view of the physician, the facts establishing their co-relation are rather a stumbling block than a help. His available practical knowledge is greatly increased if he learns to regard them as separate articles of the materia medica, with their own inherent and distinct sources, actions and uses.

Without entering into this important subject to any extent, it may be well to state here that galvanism, or the constant current obtained from a series of cells, possesses a *volume* when transmitted through the human body, of from one to fifty milliampères, which is many million

*Read by permission of the publishers before the Philadelphia Neurological Society, October 26, 1885.

times more volume than is possessed by the faradic or franklinic currents. The latter currents, on the other hand, possess a pressure (measured in volts) ranging from hundreds to hundreds of thousands of volts greater than the galvanic current, which has a volt power merely sufficient to carry the volume desired through the tissues. Galvanic currents are therefore essentially *milliampère volume currents*, and faradic and franklinic currents are essentially *volt pressure currents*.

To give a clearer idea of the differences between these two classes of currents, it may be said that the galvanic current resembles the current of water in a pipe of large calibre supplied from a low reservoir. Such a hydraulic current possesses but little pressure, but the great volume will move with relentless power any object placed before it. The faradic and franklinic currents, on the other hand, resemble an exceedingly small current of water brought from a great elevation; this current will not have the power to move the object just mentioned, but, if brought from a sufficient height, it will pierce it through and through.

The statement of the amount of *volume* possessed by a current of electricity is therefore as real an expression of the amount of electricity conveyed by it at a given time as would be a similar allusion to the amount of water carried by a hydraulic current. The volume of water is measured in cubic feet or inches. The volume of electricity is measured in ampères, or, as that is too large a unit for medical work, in milliampères or thousandths of an ampère.

The *pressure* of a current of electricity is as real as the pressure of a current of water. In the latter, it is due to the height of the reservoir above the earth; the pressure of the former is due to the height of the positive pole of its battery above equilibrium, or earth-level.

With or without the scientific explanations of their source, therefore, it is patent that *currents* of electricity differ widely in their possession of the two characteristics: volume and pressure. A graphic representation of these differences may be given by depicting to the eye imaginary cross-sections of galvanic and faradic currents.

*Fig. 1.* Relative amounts of Pressure and Volume in galvanic currents as seen on imaginary cross-section. The proportions given are illustrative.

*Fig. 1* shows such a cross-section of a galvanic current from a battery of forty or fifty cells with the considerable resistances of the human

body in the circuit. This current possesses the greatest amount of volume ever transmitted through the body, with the exception of those accidents accompanied by an inclusion of portions of the body in the circuit of arc lamps.

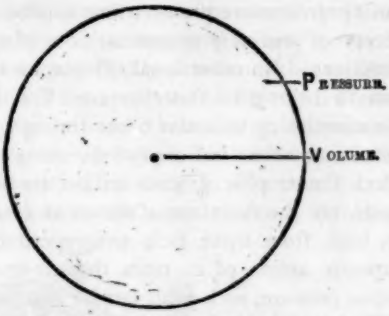


*Fig. 1.* Relative amounts of Pressure and Volume in faradic currents as seen on imaginary cross-section. The proportions given are illustrative.

*Fig. 2* shows a cross-section of a faradic current. The preponderance of pressure, and almost total absence of volume, is at once seen.

A franklinic current* might be shown in similar cross-section, but the dot indicating the volume would be infinitesimal, and the circle indicating the pressure would be too great to be shown in the space at command.

Having, then, what might for convenience be called pure volume as the predominant feature of galvanic currents, and pure pressure as the predominant feature of faradic currents, it is important to note the diversity of condition in which such qualities produce an action upon living tissue. Electro-motive, or volt, pressure gives physiological action *only* at the moment when variations of the electrical equilibrium are produced in the part acted upon; in other words: when a current is started or stopped—made or broken. Milliampère volume, on the contrary, acts mainly during the continuance of the current, and any variations in current continuity results in direct loss of this action. It follows that the

THERAPEUTICAL ACTION OF VOLT PRESSURE,

applied to the human body, is obtained by means of "makes" or "breaks" of the current used. In the case of the faradic and frank-

* The currents produced by static machines are generally, but improperly, called by the same name. Such a designation involves a contradiction in terms, as the product of the battery being a current can no longer be static.

linic currents, which are of exceedingly short duration, the "make" of the current is the only fluctuation having time to act. The interrupted galvanic current presents a different reaction at the make and break under each pole.

The effect of electro-motive pressure thus applied to healthy motor nerves, and nerves of ordinary sensation, is a stimulation of their physiological functions. No other local effect upon the human organs has been proven to belong to this "pressure" action of electrical currents. While stimulating muscular tissue through the intermedium of the motor nerves, and thus indirectly influencing nutrition, it does not directly affect the trophic process within tissues, the secretory functions of glands, nor the functions of nerves of special sense.

Deductions, both from these facts and experience, indicate that the direct therapeutic action of currents that depend entirely* upon their electro-motive pressure, such as all faradic and franklinic currents, is limited to an artificial stimulation of motion and of sensation. How best to apply such currents for these definite purposes becomes, then, an important question, intimately connected with the general principles enunciated in this paper. Want of space compels us, however, to postpone to a future paper the consideration of the recent introduction of franklinism as a motor stimulant, and its revival as a sensory stimulant; the following paragraphs relating only to the faradic current and the pressure action (interruption) of the galvanic current.

The stimulation of motor nerves is accomplished by the conveyance, by means of moist electrodes, of sufficient volt pressure through the skin to disturb the equilibrium of the nerve. Each disturbance, or shock, gives rise to a separate contraction of the muscles. Should the currents follow each other with sufficient rapidity, the separate contractions produced will merge into each other, and a tonic contraction will replace the clonic effect of a single current. Motor excitation by faradic currents subdivides itself, therefore, into two methods, as a slow succession or a rapid succession of currents is used. In applying the slow succession currents, a sufficient time should always be given to permit of the relaxation of the muscles, after one contraction, before another stimulus is imparted to them. This becomes an important matter when muscles weakened with disease are acted upon, and I cannot understand why so many manufacturers send

*It is not meant that faradic and franklinic currents actually possess *no* volume. Such a thing is impossible. It is merely contended that the volume possessed by them is infinitesimal, and its variations do not correspond to variations in physiological action.

out batteries with imperfect "slow interrupters," or entirely without them. No half-way between slow and rapid succession currents is admissible; they should be either sufficiently slow to permit of full relaxation between each impulse, or sufficiently rapid and even to produce a continuous contraction with minimum pain. No one form of rheotome that I have ever seen will answer both of these requirements, and I cannot too highly commend the rapid and slow interrupters furnished with the apparatus of Mr. Otto Flemming, of Philadelphia. The portable faradic batteries of other makers, exhibited at the late International Electrical Exhibition at Philadelphia, were, almost without exception, wanting in this essential means of therapeutic usefulness, the manufacturers evidently thinking such isolated

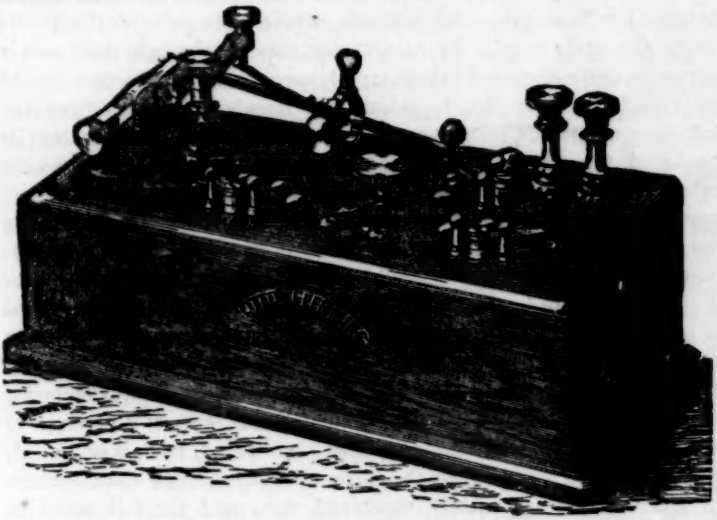

*Fig. 3.* Part of Flemming's No. 3 Faradic Battery. The slow interrupter mentioned in the text is shown in the middle background.

currents were merely required for diagnostic purposes. On the contrary, the slow-succession currents are those usually demanded for treatment, for, aside from the possible bad effect of rapid-succession currents on weakened muscle, many muscles suffering from local or centric disease will respond to single stimuli that remain totally impassive when it is rapidly repeated. The slow interrupter made by Mr. Flemming can be readily regulated to any desired frequency, the rate being capable of reduction to forty per minute; such a slow rate

is, however, rarely needed, the considerations of both economy of time and a proper relaxation of muscles uniting in indicating from sixty to eighty currents per minute as the proper rate for individual faradic currents. No efficient slow interrupter can be set to vibrate fast enough to answer as a rapid interrupter. The rapid action of the slow interrupter should, therefore, not be used at any time, producing, as it does, a jerky and fatiguing partial contraction, accompanied by unnecessary pain.

The most efficient rapid interrupters are those that vibrate the greatest number of times per minute and produce a clear note to the ear. The set screw should be regulated by the ear until such a clear note is obtained, as the resultant tonic contractions are then almost entirely free from pain—the intervals between the individual currents being absolutely equal. In contracting muscles through their motor nerves or nerve-endings by these rapidly successive currents, care should be exercised to immediately release the muscle or muscles from the influence of the current as soon as pronounced tonic contraction is produced, for a too prolonged continuance of the contraction would exhaust and weaken the muscle, especially if atrophied. This interruption of the rapid-succession current may be made by merely raising the electrode, which had been held firmly in place during the application. Less pain will be produced if the electrode is lifted quickly, or if the currents are broken elsewhere in the circuit by means of a pedal or handle rheotome, as the act of removing the electrode from the skin slowly may permit a painful concentration of the current on the small dermic surface on which the electrode is in partial contact at the moment. When the skin is lightly touched by an electrode, even if it be covered with absorbent cotton or sponge and well moistened, pain is produced, for the high volt force impels the current to leap through the dielectric air space to the imperfectly moistened skin, and the full brunt of current fluctuation is borne by the most superficial nerve filaments, which are also the most sensitive. When pain is to be avoided, therefore, the well-moistened electrodes should be firmly, though gently, pressed down. As a covering for electrodes for all purposes (except sensory stimulation of the skin) absorbent cotton, thickly laid on the face of the disc and twisted around the shank, is decidedly the best material, permitting frequent renewals without trouble or expense. It is gratifying to note the general adoption of this covering, since it was first suggested by myself in an article published in the *Medical News*, February 7, 1885.

The choice between isolated currents and rapidly-successive currents for muscle stimulation in an individual case cannot be entirely determined until a trial is made. Using one or the other in accordance with the response obtained is best. As a rule, the large muscles of the limbs and the muscles of the back, when atrophied or weakened by disease, or when naturally under-developed as in women and non-muscular men, respond best to isolated stimuli. The long motors of the fingers, and all muscles of locomotion in very muscular people, usually respond best to the rapidly successive stimuli. The latter is also the best for the abdominal muscles. The rapidly-successive currents should never be used in bad cases of those forms of muscular atrophy where faradic currents obtain a response.

The choice between faradic and galvanic currents in a case requiring muscle stimulation, lies always with the former, if a response is obtained, for if the faradic current acts at all, it will act better than the galvanic interruption, possessing, as it usually does, much greater volt power. It is also by far the most convenient to use. There is but one condition in which it fails to stimulate the nerve-muscle compound, and that is in those cases of local muscular alteration presenting the reactions of degeneration. A characteristic feature of this reaction is the total absence of farado-contractility, both in the stage of active atrophy, and in the subsequent stage of connective tissue proliferation coincident with a pronounced increase in the galvano-contractility. Here it is clearly absurd to use it, as it is evident that its good effects in muscular affections depend entirely upon stimulation of their physiological activity, the actions upon tissue metamorphosis and nutrition possessed by the galvanic current being wanting. As soon as the muscles, suffering from the condition shown by the degenerative reaction, recover sufficiently to give some sort of faradic response, this current may then be used, of course, but it will remain inferior to the galvanic interruptions for some time. The principal affections presenting the reaction of degeneration are: All *serious peripheral palsies*, produced by pressure, traumatism, etc.; *lead palsy*, and *infantile paralysis*. Notwithstanding much advice to the contrary, physicians are constantly found directing the use of the faradic current for these diseases.

The inference to be drawn from the above is that the faradic current presents the best stimulus for the muscular system in all affections finding expression in it, with the specific exceptions noted. It should therefore be used in all palsies of cerebral origin and in most

spinal palsies, and the rapidly-successive currents will be found most effective in stimulating the muscular layers of the intestinal walls.

In faradic applications designed to affect the system of *common sensation* it may be laid down as a rule that the rapidly successive currents are invariably to be used. Hyperæsthesia is best treated by the faradic current rather than the galvanic, which statement is true also of anæsthesia. The most apparent reason for this is, that the faradic current presents the best way of treating the nerve centre by stimulating or sedating its action centripetally. The sensorial-sedative action of the faradic current is obtained by the use of *moist electrodes*, the anode being the pole applied locally. Very gentle currents should be used, and especial care be taken that the interrupter works smoothly, and without irregularity in the note given to the ear, as any differences in the time space between the individual currents will lessen the sedative action. The sensorial-stimulant action of the faradic current is obtained by the local use of a *dry* electrode, the kathode being the local pole, with the moist anode placed indifferently. A metallic hair brush with plug connection for the cord is the most convenient kathodic stimulant for large surfaces. The dryer the skin the more superficial becomes the application to the nerve terminations.

The modes by which all therapeutic action is derived from faradic electricity being therefore understood as either motor stimulation, or sensory stimulation or sedation, the secondary results of such local action upon remote seats of disease can be intelligently understood. The general condition of a neurasthenic patient can, for instance, be improved by the systematic stimulation of all the muscles of the body, the weakened nervous system being allowed to rest meanwhile. It is however in the efferent action of the sensory nerves that greatest power is wielded by faradic electricity in non-local diseases. All motor stimulation involves some sensory stimulation also, owing to the mixed character of the nerves, and it thus happens that sensorial impressions are constantly being carried to the perceptive centres during all applications. The effect of such impressions in modifying the condition of the centres is, I am convinced, considerable. The neuroses, especially, are open to the good effect of these efferent sensorial impressions, from the slighter form of a nervous headache to the graver cases of hysteria. There is also reason to believe that the progress of organic centric alterations may be modified by these impressions, as the good effects of dry stimulation of nerve extremities in locomotor ataxia would seem to indicate.

THERAPEUTICAL ACTION OF MILLIAMPÈRE VOLUME.

Reverting to what has already been said of the physical characters of currents, it should be particularly borne in mind that, of the currents in medical use, galvanic currents only furnish sufficient *volume* to be therapeutically appreciable. It is to be greatly regretted that much misinformation has been systematically though innocently spread before the profession on this subject, especially by certain instrument makers who have not thoroughly mastered the theories they practically embody. No faradic current from the ordinary coils in use can give sufficient volume, when transmitted through tissue resistances, to give a particle of therapeutic action, whether the current is derived from a primary coil of short, thick wire, or a secondary coil of long, fine wire. The physiological and therapeutical effects of faradic currents are due only to their current *pressure*, and no false claims of the possession of current *volume* should be permitted to obscure the recognition of their legitimate action and powers.

In the galvanic current of bearable strength, on the contrary, the physician has a means of introducing locally and with considerable definiteness, such doses of current volume into the human organism as experience and prudence dictate.

The action of current volume on living tissue has been the subject of considerable examination at the hands of various electrologists, but many of their results have been confused and rendered misleading by a failure to separate it from the action of current pressure. If an electric light current of ten ampères (10,000 milliampères) is accidently passed through a man's arm, it will instantly burn deep eschars into the flesh. The man will also become unconscious from the shock of current recomposition. The effect of the volume here is the cauterizing action, which is excessive in proportion to the immensity of the dose. When a proper dose (one to fifty milliampères) is conducted through the skin by moist electrodes, the vital processes in the vicinity of each pole become altered and quickened, the changes produced being proportional to the amount of volume distributed per area and the length of the application. The many diverse and occult actions involved in this tissue change under the continuous application of current volume, have received the collective name of "catalytic action." It is made up of electrolytic decomposition and transference of particles of tissue; stimulation of the organic life of formed tissue, such as the muscular coats of the capillaries and the secretory tissue of glands, and stimulation of the primal cell-life of tissue. The total divergence of this

action from that obtained from fluctuations of current pressure is apparent. It is almost immediately observable in the skin under electrodes, and the depth to which it will extend into the tissues beneath the skin depends upon the strength of the current and the disposition of the electrodes. One, at least, of the latter should be placed as near the seat of the disease as possible, the other being so applied to the body that the direct route of the current shall include the *locus morbi*. It should be remembered that the bulk of the galvanic current takes the path of least resistance through an irregular conductor like the human body, much of it, though, being deflected in all directions to the most extreme limits of the body.

There is no doubt but that there is a difference in the catalytic action of the cathode and anode, as well as in their pressure action. A study of this subject would, however, be somewhat lengthy, and as the theoretical considerations have as yet received but little practical confirmation, they will not be mentioned here. The physician may well be satisfied if he wisely discriminates between faradism and galvanism, and if the latter is indicated, maintains an effective concentration of current volume upon the diseased tissues.

When the galvanic current is applied for its volume or catalytic effects, no interruptions or fluctuations of the current should be produced in the circuit; and as the catalytic effects are those usually desired in practice, it may be stated as a rule that galvanic interruptions are only needed in electrical examinations of motility, and for therapeutic use in cases where the faradic current fails to obtain motor response: viz., in cases of paralysis presenting the reaction of degeneration. All other applications of the galvanic current should be so begun and ended that as little of the pressure action as possible is given. This is accomplished by a gradual addition of cells after the electrodes have been placed *in situ*; or, by beginning the application with a large number of cells in circuit with a water rheostat having its rod carefully pulled up, to be subsequently pushed down until the desired strength is obtained. This latter method is best used with a milliampère-meter also in the circuit, when the exact number of milliampères actually passing can be regulated at will by the rheostat and read off on the face of the meter.

It will be observed from what has already been said that the milliampère, or thousandth of an ampère, is used in the measurement of current volume, while the volt is the true measurement unit of the faradic current. Unfortunately for scientific precision, no means for

determining the exact number of volts in actual use in faradic currents has yet been attached to the batteries, and we are compelled to rely on arbitrary scales for their measurement—scales that really differ with each battery. I am, at present, in conjunction with Mr. Otto Flemming, the instrument maker, endeavoring to overcome this difficulty of measurement for comparative purposes, and hope to devise a method by which the current from medical coils can be graduated in absolute numbers of volts. In the case of the galvanic current, however, we are already supplied with meters for absolute measurement of milliampères during the application—the milliampère-meter. It differs widely from an ordinary galvanometer, both in construction and graduation, but the user does not really require to know the details governing its construction much better than similar details of the gas meter in his cellar; pro-

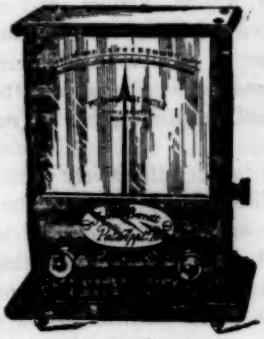

*Fig. 4.* Barrett's Milliampère-meter.

vided he understands that the index will accurately show to the eye the volume of current in circuit at a given moment, with any accidental fluctuations that may occur. The ordinary galvanometer that has been supplied with batteries is not graduated to milliampères, and such a re-graduation is not readily applied to them.

By the use of the milliampère-meter included in the circuit with the patient the operator avoids the necessity of constantly calculating how much volume he will have from cells with known volt powers when the skin of different parts of the body, or of different persons, is included. It therefore constitutes the only reliable means of accurate dosages of current volume, and is far more necessary in practice than a similarly accurate measure of the gradations of volt power in faradic currents, as the sensations produced by the latter make a good subjective test, at

least. The accompaning cut (*Fig. 4*) represents the most convenient portable milliampère-meter that has yet been presented to the profession. It is manufactured by Mr. John A. Barrett, 13 Park Row, N. Y., and can be attached to any galvanic battery.

The principal therapeutic indication for the use of current volume is, in my opinion, the desirability of subjecting diseased tissue locally to its alterative action. The breadth of this statement immediately exalts the medical use of current volume far above that of current pressure, for it indicates a possibility of remedial value in all organic pathological alterations where the seat of disease can be brought under its influence. Organic diseases of the spinal cord, and even of the brain, promise amelioration or cure by its use, and it is almost invariably the preferable application to mucous membranes, such as those of the mouth, throat, vagina, urethra, and uterus ; but when used on the last mentioned surfaces, especial care should be observed in the dosage, as one is apt to be deceived by the small resistance of mucous membranes as compared with the skin. From a half to five milliampères is usually sufficient, and the number of cells required is very small.

When it is desired to act alteratively upon glandular tissue of any character, such as in diseased conditions of the liver, pancreas, spleen ovaries, testicles, etc.; or when it is desired to stimulate any of the special senses by direct or reflex excitation, the volume action of the constant galvanic current renders it decidedly preferable to the faradic.

De Watteville has called attention to the value of combining the volt and milliampère currents simultaneously in applications to the general abdominal contents through large electrodes. Rapidly-successive faradic currents are used in the same circuit with a continuous galvanic current, care being observed that the latter is not broken by the faradic rheotome. Mr. Flemming has, at my suggestion, devised an addition to his combined batteries, making this double current at the same moment possible. It is called a "combiner." The association of the local muscular stimulation and the centric sedation of the faradic current, with the volume effects of the galvanic, is at times most happy.

Briefly summed up, the faradic current presents the best form of electricity for the treatment of those diseases in which a stimulation of motility or sensibility is either directly or indirectly curative, with the single exception of disorders characterized by the appearance of degenerative response; while the constant galvanic current may be relied upon to fulfil the remaining possibilities of electricity in medicine.

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# STRICTURE OF RECTUM WITH FISTULA.

By J. McF. Gaston, M. D.

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BELIEVING, as I do, that this is a progressive age in medicine and surgery, the example of a recent author in dwelling largely upon the practice of the ancients in diseases of the rectum, will not be followed, but rather the attention of the reader shall be directed to some of the recent advances in the treatment of this class of diseases.

Congenital malformations of the rectum or occlusions of the anus do not enter into our consideration at present, while it may be stated that out of three operations for imperforate anus in my hands, one escaped, and was permanently relieved. The study of embryology has, however, thrown much light upon the structure of the lower portion of the intestinal canal, thus leading to a better acquaintance with its diseases.

In the elaborate article of Morton and Witherill, in the recently published second volume of Pepper's System of Medicine, it is stated that the rectum, in its upper and middle portion, is derived from the internal and middle layers of the blastodermic membrane, while its lower third, with the anus, like the buccal cavity, is formed by the external and middle layers. The rectal veins are usually divided, like the rectal arteries, into three sets—superior, middle and inferior. They form two distinct venous systems, the rectal emptying into the portal system, and the anal terminating in the internal iliac.

The throat and rectum are the counterparts of each other in their relations to the alimentation of the human body, and have many points of correspondence in their structure, being supplied with somewhat similar means of opening and closing at each extremity, and being composed of tissues in their walls, which are alike subject to induration and thickening with constriction of the passage.

A proper understanding of the normal functions of a part is important for the comprehension of its deviations from the natural condition, and some general impressions of the anatomy and physiology of the rectum are very desirable for those who would investigate

the disorders to which this portion of the organization is liable. All are aware of the existence of the circular arrangement of two sets of muscular fibres near its outlet, by which it is automatically closed, except when a voluntary dilatation is effected, for the release of flatus or the discharge of fæcal matter. There is, however, at the upper boundary of the rectum, another distribution of circular contractile fibres, which constitutes a division between it and the sigmoid flexure of the colon. This annular muscle has not received, in the standard text-books, the kind of recognition from anatomists or physiologists, which its role in the animal economy demands; and it is evident that misapprehension exists, in practical works upon the functions of the rectum, as to this effective barrier to the descent, ordinarily, of the excrementitious matter. It is a veritable superior sphincter, separating the large intestine from the discharging tube, and whenever the desiccated mass passes this muscular constriction and accumulates in the rectum, it causes more or less discomfort, and, by remaining there, becomes a source of trouble, or even of disease.

The residuum of the digestive and assimilative processes finds its way through the ileo-cæcal valve into the colon as a reservoir, and there undergoes certain alterations, which doubtless, upon the principle of endosmose and exosmose, modify the nutrition of the organism; but when the mass reaches the sigmoid flexure of the colon, it is deprived of all the properties which can serve any useful purpose, and only contains effete materials. When a deposit of this debris takes place in the rectum, it acts as a foreign body, and stimulates the muscular fibres of this canal to contraction for its expulsion by the anal orifice. But if from any cause it remains for an undue period, the indurated mass induces more or less disturbance locally, and extends an erethism to the general system through the nervous connections of this highly organized tube.

Thus it occurs that the rectum becomes a seat of disease, which manifests itself in various forms. Among these disorders fistulas are not uncommon, with the occasional development of fibrinous indurations, involving a greater or less extent of the tissues forming the walls of the rectum, diminishing its calibre, and constituting a constriction of this outlet of the alimentary canal.

Fistulas generally originate from some abrasion of the mucous membrane of the rectum, included between the upper recto-colic and lower anal sphincters, already referred to as defining the proper limits of this elastic stop-cock of the waste materials. The exudations from

the stercoraceous deposit penetrate through such abrasions into the cellular tissues surrounding the walls, and permeate by a disintegrating process until, by suppuration, an exit is found through the skin surrounding the anus. If it stop short of an external discharge, it is styled a blind, or incomplete fistula; while there may be also cloaca formed in the cellular tissue, or a suppurating cavity opening into the rectum. Again, an abscess near the wall of this canal may have only an external opening.

When a fistulous tract has both internal and external openings, it is recognized as a complete fistula; or there may exist two orifices in the mucous membrane of the rectum, with a fistulous connection through the cellular tissue of variable length.

Indurated fibrinous deposits may involve a part or the whole of the circumference of the rectal wall, jointly with one or another of these forms of fistula, or may occur independent of any suppurating tract, as a result of inflammatory action in the cellular tissue. An organic stenosis may likewise be developed at the separation of the colon from the rectum, or at the anal outlet, presenting features entirely distinct from the spasmodic constriction of the superior and inferior sphincters, and requiring different operative procedures.

This paper is limited to the consideration of such impediments as result from fibrinous depositions in the course of the rectum, and at the entrance from above or at the outlet below, constituting organic stricture. The portion of tissue involved may be so limited that the constriction shall partake of the nature of a cord encircling the lumen of the canal, or when the circular muscular fibres are implicated to a greater extent, it assumes the character of a band or belt, while again there may be such an extension of the fibrinous deposit as to present the form of an indurated mass with contraction, implicating the wall more upon one side than the other of the rectum. The induration may be slight in some part, yet more or less contraction exists throughout the circumference, thus giving less space for the passage of the fæcal mass at its site.

In part II of the elaborate work of Professor Ernst Ziegler, on special pathological Anatomy, we find a concise statement of the causative elements which are operative in producing this condition of the rectal wall. "Proctitis is an inflammation of the rectum. In many points it resembles inflammation of the vermiform appendage. Foreign matters and stagnating fæces are frequently the exciting agents; but disturbance of the circulation in the hæmorrhoidal veins may likewise end by inducing inflammatory change in the bowels. Proctitis

often results in the formation of ulcers and of fibroid hyperplasia, taking the form of induration of the rectal wall, or of polypous excrescences. The inflamed surface is usually covered with a muco-purulent exudation. When the inflammation and ulceration extend deeply into the tissues of the wall of the bowel, the surrounding connection tissue becomes infiltrated and hyperplastic, or breaks down into abscesses containing fœtid pus."

It is highly important in a practical point of view to distinguish the ordinary inflammatory indurations and constrictions of the rectal wall from malignant affections of the rectum; a further quotation from Ziegler's work will serve to elucidate this diagnosis.

"Rectal cancer sometimes extends only to the parts about the anus, but in other cases it invades the pelvic and abdominal viscera.

"Intestinal cancer takes the form of soft fungous tumors which are solitary and sharply circumscribed or of papillary roughnesses and excrescences covering a considerable area.

"Infiltration of the intestinal wall with cancer cells usually takes place at an early stage and leads to thickening and induration. If this extends round the whole circumference of the bowel, it is transformed into a thick-walled rigid tube; the rectum is the commonest seat of this indurative change, and less frequently the colon.

"In most post-mortem examinations of cases of this disease, we find the surface of the neoplasm already broken down, leaving a cancerous ulcer with characteristically infiltrated borders. But sometimes the borders likewise are disintegrated and eroded, and then the ulcer has quite the appearance of an ordinary non-malignant inflammatory ulcer. In other cases, the borders and floor of the ulcer become scarred over and shrunken, leading sometimes to extreme constriction of the bowel; this is particularly apt to occur when the ulceration extends in an annular form round the intestines."

It will be perceived that the pathological conditions of the malignant and non-malignant indurations of the walls leading to constriction of the rectum have so many points of resemblance, that it is only practicable to distinguish them by close attention to the history of individual cases; and tentative measures of treatment are sometimes requisite to make a final diagnosis. The gravity of carcinomatous disease of the rectum calls for extirpation, while the simple induration from fibrinous deposition or connective tissue growths would not warrant such procedure; and unless the concomitant circumstances indicate clearly the cancerous character of the affection, it is proper to proceed

upon the supposition that the case is one of ordinary non-malignant character.

If it fails to be relieved by a diligent use of means adapted to cure the results of simple inflammatory action in the tissues, this will naturally cause apprehension as to the nature of the disease, yet our medical and surgical resources should be exhausted before abandoning the conservative process of treatment, and resorting to a destructive operation.

The difficulty of diagnosing strictures of the large intestine above the recto-colic sphincter are greatly enhanced by the sigmoid flexure, which necessitates either a curved or flexible tube for the exploration, and though bougies of different material have been used for adapting themselves to the curves, while the endoscope has also been resorted to for illuminating the dark recesses of this region, no satisfactory information is received by this route. As a consequence, the data are to be supplemented by external manipulations, which, in persons without much fatty deposition, may materially assist in forming a diagnosis.

The process of exploring the rectum and lower portion of the colon by the introduction of the entire hand is of very doubtful propriety in any case, and can scarcely be warranted for defining the extent of stricture, since the presence of such a constriction within the limits of the rectum as to require interference, would preclude the entrance of even a small hand entirely within the canal.

The exploration, however, with the fingers is the most important measure at our disposal for ascertaining the condition of the walls of the rectum, and by enjoining upon the patient a bearing down effort, as if for the expulsion of fæces, the whole tract of the canal may be brought within the range of the index finger. A well-educated touch is worth more than the sense of sight in determining upon the state of the submucous tissues, and even in examinations per vaginam, for ascertaining the condition of the os and cervix uteri, the digital exploration serves to elucidate the case more than the inspection of the parts by means of the speculum.

The exception of ulcerations or excoriations of the os uteri, and catarrhal or other discharges from the neck of the womb, which call for ocular examination, holds in those rectal troubles, which complicate stricture and are not readily recognized by the sense of touch, such as ulcerations and fistulas, involving the mucous membrane of the rectum or lower part of the colon.

As to the proper mode of inspecting the cavity of the rectum, the opinions and experiences of surgeons vary almost as much as in regard

to the ocular examination of the vagina, and as Sims succeeded in adopting the most efficient means for the latter, he has devised a wire speculum for the former, which affords the most satisfactory observation of its lining membrane. Those who have much experience in rectal explorations, will doubtless agree with me, that none of the expanding instruments give a correct impression of the surface to be inspected, as the tissues are put on the stretch, and at the same time only limited portions exposed to view. This objection does not hold so forcibly against the cylindrical fenestrated glass speculum with a reflecting inner surface which, being turned upon its axis, brings the various segments within the field of observation.

But for practical information as to the inner surface of the rectum, I have secured the best results with the simple oblique opening at the inner end and a bell expansion at the outer end of a cylindrical glass speculum, with an interior reflecting surface and covered with a black coating outside. Let this be introduced slowly, and observation made step by step with a good light, either from the sun or a bright lamp, and every portion of the surface will be distinctly seen, while in its withdrawal the observation may be made again throughout the entire canal, so as to detect any ulceration or fistulous opening that may exist. This simple anal or rectal speculum can be had long or short, and of whatever diameter desired, and is best fitted not only to see every part of the cavity, but also is best suited for making medications of the surface, as the substance applied is kept from contact with other portions of the lining membrane of the rectum, and lint or cotton can be passed through it.

But the point of most importance in connection with stricture is in varying the calibre of the tubes, so as to obtain an accurate idea of the extent of the induration, not by passing within the circumscribed band, but by including the constriction within the lumen of the speculum; by the use of a probe or sound in contact with the induration, the extent of it may be defined, and at the same time an approximate estimate may be made of its distance from the anal outlet.

Having obtained all the information practicable by digital examination, by the bougie, and by the speculum, we may dispense with instrumental assistance in dilatating or exposing the parts to be operated upon; and after moderate distension with the thumbs, avoiding undue force, the fingers placed in the conical form, are to be used for overcoming the contractility of the external and internal sphincter, so as to facilitate the further operative procedure for the division of the

stricture. The presence of a speculum at this stage interferes with the proper manipulations, and the sense of touch, even when a fistula is to be divided as a preliminary step, affords us a better guide than inspection. A flexible tube for traversing a tortuous canal is preferable to any other sound or directory, and serves as a good conductor for the chain of an ecraseur, should this be used in cutting the tissues, or for passing a ligature, in case this mode of dividing the interposed mass is resorted to by the operator. The ligature carrier of Allingham or of Helmuth are well suited to a fistulous tract without sinuosities, but may be substituted by a metallic-eyed probe, which may be bent to suit the curvature of the sulcus, and thus carry the elastic or other cord from the external orifice into the intestinal opening, when it is caught by the point of the index finger and drawn through the anus.

The only plea for division with a ligature in preference to the knife, is to avoid hæmorrhage, and this is accomplished quite as effectively by the chain of an ecraseur, while it is a much more expeditious proceeding. The idea advanced by some that in the use of a ligature the sulcus becomes obliterated behind, as the cord cuts its way through the contained structures, may hold when the fistulous tract is not supplied with a pyogenic membrane, but cannot be realized in old fistulas; and the obliteration of this callous surface must still be effected by means of lint or other processes for establishing granulation in the course of the original tract. This must at least consume more time and produce more wear and tear of the forces of the patient than a speedy division with the knife or ecraseur, and dressing at once from the bottom of the wound so as to develop granulations. So soon as the pyogenic membrane disappears throughout the whole extent of the fistulous canal, and granulations are set up in continuity with those of the lateral surfaces, an effort should be made to bring about the process of "union by granulation" for the prompt closure of the wound, by approximation of its margins with compresses upon either side. Deep incisions may thus be healed in much less time than they could fill up by granulations, and with better results.

The curative steps indicated for stricture of the rectum of a non-malignant nature, vary according to its extent, and the complications of ulceration, abscess, fistula or specific disease. In the slighter constrictions, dilatation has been resorted to with good effect, and in those presenting much resistance, divulsion succeeds in overcoming the stricture temporarily, but with inflammatory consequences, which make it a hazardous measure. The different processes of division by the

knife, ecraseur, galvano-cautery and thermo-cautery, commend themselves to the surgeon in the various modifications of stricture which are presented for treatment; but most cases may be effectually relieved by incision, and this treatment has proved so satisfactory that I am disposed to give it the preference to the other modes of proceeding.

The recommendation of Kelsey for external proctotomy over the internal operation, in cases not requiring the division of the sphincter on account of fistula in ano, necessitates an extension of the wound which is not requisite for the success of the operation by division with the knife. While there is greater exemption from hæmorrhage in the use of the ecraseur and galvano or thermo-cautery, the limitation of the incision with the knife to the indurated band constituting the stricture does not implicate blood-vessels which cause much risk of hæmorrhage, and all things considered, this operation affords the best results. There is no difficulty in effecting sufficient dilatation of the sphincter ano by digital distension, for all the manipulations requisite in the performance of the internal operation by incision, nor is there any embarrassment from the contraction of the sphincter in making the subsequent dressings of the wound. The authority of Trelat, Verneuil, Gosselin, Tillaux, Labbé and Fochier, in favor of other means than the knife, may be disregarded in the operation for stricture of the rectum. I am very partial to the use of the ecraseur for deep-seated fistula in ano, such as reported by me in the *American Journal of Medical Sciences* for the year 1881; but there can be no necessity for this mode of proceeding, nor for the cautery process in the division of the fibrinous band by internal proctotomy, as the tissues involved have a limited supply of blood vessels. If the operation of external proctotomy should be required from the co-existence of stricture with a fistula having an external opening, these measures might be preferable to the knife for the division of the tissues, yet an incision may generally be made with safety from the point of the coccyx to a distance of three inches up the rectal wall. The essential element in operating for stricture of the rectum, as in stricture of the urethra, is that every fibre of the constricting band shall be divided, and it is sufficient if this be done at a single point. The indurated fibrinous deposition being completely cut through, no considerable dilatating force should be subsequently employed, as the strain comes upon the cellular tissue adjoining the incision and distends it without exerting much or any influence upon the dense structure of the stricture. A pledget of lint should be placed between the divided edges, so as to prevent reunion, and to secure

proper adaptation to the bottom of the wound. A packing of lint upon this within the space embraced by the stricture is requisite, or the same end may be attained by placing a sponge tent within the ring formed by the divided band, which, by its distension, shall retain the lint in its proper position.

The result of such a proceeding is simply to keep the margins of the incision through the contracted band from uniting, and cause the wound to fill by granulations from the bottom. In the meantime, the adventitious tissue entering into the stricture, being relieved of all tension, gradually undergoes absorption, and thus a cure is accomplished.

I am so fully impressed with the false doctrine and erroneous practice involved in forcible dilatation of the strictured region, after either internal or external proctotomy, that my colleagues must excuse this urgent protest against the teachings of most authors in favor of tamponage, or other means of distension, with a view to prevent contraction in healing. It was formerly recognized as orthodox, after dividing a urethral stricture, that the use of the bougie or sound was essential to obviate the closure of the stricture, but practical observation has satisfied me that the repeated attempts at dilatation after incising a urethral stricture only irritates the part and interferes with the progress of granulation, without any beneficial effect in preserving the full diameter of the canal. The urine serves to distend, more or less, the urethra, and to prevent, by its contact with the surfaces, their union by first intention, while the retraction of the contractile tissue forming the stricture, keeps the edges apart, so that the incision fills by granulation, admitting of the restoration of the normal lumen of the urethra at the site of the former stricture.

The facts and reasoning in support of this view are given in my paper on "Division of Stricture Without Subsequent Sounding," for the April number of the *Atlantic Medical and Surgical Journal*, 1884, and no case thus treated has failed to be completely relieved, without the concomitants of rigors, fever and local irritation which attend the introduction of bougies or catheters.

The dissection of an annular stricture from its attachments, in cases of doubtful diagnosis, affords a security against its progressive development towards malignancy, and has even been adopted, when no cancerous tendency was suspected, with a favorable result. Lowson's case of stricture of the rectum, treated by excision of the stricture, reported in the *Lancet*, of April 12, 1879, was attended with considerable contraction, but this may be attributed rather to the delay in the

union of the parts than to the essential concomitants of the resection of the rectal wall. In a well circumscribed induration encircling the canal, the mucous membrane may be divided in a circular form above and in close proximity to the stricture, by a narrow, short blade at right angles, lateral to its shank, which is passed through the aperture of the constriction, and carried, with a circular movement, around the inner circumference. The division of the tissues around the wall beneath the induration is readily effected with the point of a scalpel passed through a speculum, and, pulling down the indurated ring, it is dissected out. The two ends of the tube are then united by sutures, and under favorable circumstances, union should take place by first intention, without any suppuration from the deep seated tissues. A moderate packing of the cavity of the rectum, with absorbent cotton, is requisite in this case, so as to ensure the complete contact of the outer surface of the canal with the raw, incised tissues around it, for otherwise there must exist an open space for the collection of serous exudation and the formation of pus, which should be obviated by the agglutination of the adjacent surfaces. With such precautions, excision of stricture of the rectum promises a satisfactory result.

In illustration of my mode of proceeding in the operation for stricture of the rectum, I have space to cite only two typical cases, differing in details as to the mode of incising the indurated band, and in the subsequent management. One was in the person of a teacher, about forty years of age, who resided in the city of Campinas, in Brazil, and gave the history of trouble for several years in defecation, which was complicated with fistula in ano. After a preliminary examination in connection with my colleagues, Drs. Melchert and Lima, chloroform was administered, and the fistula, extending from the outside of the sphincter to an inch above it within the mucous membrane, was divided with the bistoury, which exposed the circular indurated mass, with an aperture that with difficulty admitted the point of the index finger. A free incision posteriorly from the opening through the fibrinous band, relieved the constriction, and it was discovered that a cloaca above required to be laid open. The bottom of the wound was packed with lint, and a large sponge tent was placed within the indurated ring. With daily repetition of this dressing and the passage of a large rectal bougie on each occasion through the portion of the rectum involved, the case progressed with occasional aggravations of symptoms to a final result, which afforded exemption from his previous

troubles. The evident irritation attending this mode of proceeding caused me to resolve upon a change in the treatment of subsequent cases.

The other patient being a gentleman in Atlanta, Ga., who had undergone incision of the stricture by cutting through the indurated band at three different points, came under my care two years afterwards, with return of the constriction, complicated with an internal blind fistula below the stricture. He was a druggist, whose health was so impaired by his condition as to unfit him for his duties. As he had passed the middle period of life, his general prostration, caused some apprehensions for the result. The thickening and induration extended around the entire inner circumference of the rectum, but assumed a well-defined band on the posterior segment, so that it was determined to divide the constriction alone at that point. With the coöperation of Drs. R. C. Word and Bryan, the patient was brought under the anasthetic influence of ether, when the sphincters were dilated with the thumbs, followed by the introduction of the fingers in a conical form, and the blind fistula was slit up with the bistoury.

Being now enabled to grasp the posterior arc of the indurated ring, by passing the index finger through the constriction and forcing the thumb from below and outside of the band, a trocar was thrust through the tissues beyond the induration, and leaving the canula as a guide, the bistoury was carried by its side, making a free cut inwards, so as effectually to sever every portion of the constricting mass. A simple dressing of lint was pressed gently into both wounds, without any forced dilatation, and by daily repetition of this for a week, followed up with pledgets of absorbent cotton for three subsequent weeks, a satisfactory cure was accomplished so far as the stricture and fistula were concerned.

There continued some ulceration at and above the recto-colic sphincter, which required applications of nitrate of silver and iodoform for several months, but eventually this complication was relieved by a combination of local and constitutional measures, so that complete success has crowned this simplified incision of stricture of the rectum with fistula. The induration disappeared without any tamponage or other means of dilatation, and the case affords a sufficient guarantee for this operation and after-treatment.

As a preparatory measure for operating on the rectum, it is usually advised that a laxative be taken, but when the effect of stimulating the peristaltic action of the bowels is properly considered and the proba-

bility of its continuation up to the occasion of operating, or even afterwards, is duly recognized, we may well dispense with this time-honored injunction as one of the errors of past routine. If the physical derangement of the patient calls for purgation independent of any preliminary step for proctotomy, then of course it may be allowable for the special end to be attained. But should the alimentary canal be found in the proper performance of its functions, it is only requisite to remove the accumulations in lower bowel by the free use of enema of warm water before entering upon an operation for stricture or fistula involving the rectum. The common precaution of giving an opiate after such unloading of the canal is certainly calculated to afford relief from the prompting to early movement of the bowels, and so far is warrantable. But there is no more propriety in keeping the intestines bound up during the subsequent treatment of such cases than there would be in fissures of the anus or in hæmorrhoids, which are well known to be aggravated by torpor of the bowels.

The natural daily evacuation of the alimentary canal after passing two days immediately succeeding an operation upon the rectum, relieves any turgescence in the parts, and does not leave the surface of the incision irritated, as the mucous covering of the fæcal mass with the exudations from the cut surface protect the granulations; yet it is expedient to wash out the rectum with warm water immediately after each evacuation, and re-apply the lint dressing to the bottom of the wound.

Subsequent to the ordinary incision for fistula in ano, it has been my custom to administer a dose of laudanum, so that the first dressings should not be disturbed during twenty-four or even forty-eight hours, but after this lapse of time I do nothing to restrain the action of the bowels. Should they not move spontaneously, I resort to an enema of warm soap-suds to procure evacuations. A gentleman recently under treatment in my surgical infirmary after incision of a fistula, was given an enema regularly every third day, as his bowels failed to act without this artificial assistance. It will be understood that in this case, as in the division of stricture of the rectum, the intention is to secure the filling up of the wound from the bottom, and consequently any forcing of the edges apart by the passage of the fæcal mass does not interfere with the granulating process or with the progress of the cicatrization in healing.

I have dwelt upon this feature of the after-treatment in operations for stricture of the rectum and fistula, because the contrary course is so generally inculcated by authors and adopted by operators to the

prejudice of the case and the discomfort of the patient. It is not, according to my observation, a matter of indifference whether tamponage of the rectum is resorted to so as to distend and dilate the constricting band, or simply to separate the surfaces of the divided tissues, as the latter is the only indication to be met; nor is it of slight importance whether the bowels should be blocked up or evacuated regularly, while appropriate dressings are continued, since the healthy condition of the organism is maintained only by periodic intestinal action. Thus, the mode of operating in such cases, and the subsequent local management of the incision, are of paramount importance for a successful result of the treatment.

## PERTINENT QUESTIONS REGARDING TYPHOID EPIDEMIC AT PLYMOUTH, PA.

By K. D. Shugart, M. D.

DR. E. O. SHAKESPEARE, in the The Physician's Magazine, of August, 1885, makes out a very strong case of infection, and that from the excreta of *one* typhoid patient, a portion of which had been frozen for months. The freezing, he claims, holds the infectious materia morbi of the excretion in a state of hibernation, but does not destroy it. Are we sure that freezing has no destroying influence upon the *supposed* infectious properties of the excreta of typhoid patients? We feel inclined to ask many pertinent questions such as, were there no other persons who might have taken the fever, in the house with the first patient, where the excreta was kept until night fall? Can the excreta of one typhoid patient, after being frozen in snow for months, then being diluted with pure, heavenly distilled water, at least millions of times its own bulk, and afterwards divided between thousands of persons—can it still carry the typhoid nidus?

The Doctor says: "A section of Plymouth supplied exclusively by the Susquehanna water and a few wells, containing a population of 800, is free from the disease, except in the case of eight persons, five of whom, previous to their attack, had been in the habit of going into the town and drinking the mountain water, while two were recent cases of secondary infection. In other portions of the town, the extent of the disease was in direct ratio to the amount of mountain water used, and averaged one-tenth of the population." Furthermore: "The moun-

tain stream has four reservoirs, the lower one distributing water throughout the town. The water in all the reservoirs was nearly exhausted at the time of the pumping, and was also frozen."

Would it not be easier to explain, and more natural to find the original cause in the water, as it was in the reservoirs, even without taking the frozen excreta into account? The reservoirs were well nigh "exhausted," and all of the undissolved animal and vegetable matter not held in solution, which had been accumulating the previous season or seasons, would naturally settle to the bottom, so that the inhabitants were drinking the dregs of the four reservoirs. May not that have been *the* materia morbi? Besides, the reservoirs being frozen, would prevent, to a certain extent, the escape of the gases that might be formed under the ice in them.

When we take into account the *many* sporadic cases of typhoid fever, occurring year after year, and in localities differing so widely in their surroundings, ought we not to be slow in arriving at conclusions without first weighing all of the evidence pro and con? It was an easy way to account for the Plymouth epidemic to charge it up to the excreta, if there be no rebutting evidence, or no cross-examination. I have, in the past thirty odd years, seen typhoid fever, in the populous city, on the open prairie, on the mountain tops of Colorado, and on the arid plains of Southern California, that I know could not be traced to the "specific infection," contagion. Then, may we not with propriety doubt the "specific" character of the disease at Plymouth, Pa.? In conclusion, is there no other way to account for the Plymouth epidemic, than to charge it to the frozen excreta of one typhoid patient? How came the first one to have typhoid? And *if* typhoid fever is contagious, why is not one attack at least a *partial* guarantee against after attacks?

*Riverside, California, October 19, 1885.*

## THE EPIDEMIC OF TYPHOID FEVER AT PLYMOUTH, PA.

STATEMENT OF ACCOUNT.

THE PEOPLE OF PLYMOUTH, PA.

To Experience, Dr.

One lesson on natural laws.

| *Items.* | *Value.* |
|---|---|
| Lives, 107, | $00,000 00 |
| Extra expenses, | 60,000 00 |
| Wages, enforced idleness, and care of sick, | 60,000 00 |
| Total, | $120,000 00 |

C. O. D. Received payment,

Experience.

# THERAPEUTIC NOTES ON MALT EXTRACTS.

By William F. Waugh, A. M., M. D., Philadelphia.

[Professor of Practice of Medicine and Clinical Medicine, Medico-Chirurgical College of Philadelphia; Late Assistant Surgeon, U. S. Navy; Member American Academy of Medicine; Academy of Natural Sciences, and the Microscopical and Biological Section; Philadelphia County Medical Society; Philadelphia Medico-Legal Society; Pennsylvania State Medical Society, etc., etc.]

LIKE the American mineral springs, a large number of popular remedies suffer from the effects of being too generally recommended. According to the claims of their originators or proprietors, they are useful in the most bewildering variety of ailments —true panaceas, curing every disease, from fibroid phthisis down to nervous asthenia. Where too much is claimed, we are apt to grant too little; and when we have been disappointed by using a drug in cases not suited to it, we are likely to doubt altogether its possession of any therapeutic value.

Among these over-vaunted remedies are the extracts of malt. Owing their popularity largely to Niemeyer's favorable mention, they were used indiscriminately in all forms of consumption, and in other wasting diseases; and the many failures which must necessarily follow so unscientific a method of dosing, threaten to cast discredit upon these drugs, even in cases well suited to their powers.

The extract recommended by the great German clinician contained the bitter principle of hops, and was rather an extract of malt liquors than of malt alone. I am not sure that such an extract is now to be found in the market; nor is it needed, as the hops may be added if wanted, while in many cases they are unnecessary, or even objectionable.

It should be borne in mind that the simple malt extracts are compound preparations, containing a concentrated and highly nutritious food, and a digestive principle which has the power of converting starch into sugar. The peculiar value of the nutrient element is due

to its assimilability, its transformation into healthy tissue being accomplished with unusual readiness.

The digestive principle, diastase, has no action upon fat or albumen, and would be useless if given in cases of indigestion of these foods. Acting only in alkaline solution, it should be given before meals, with some form of starchy food.

Such being the general principles governing the use of malt extracts, we may briefly consider their application in the treatment of special diseases.

### CORPULENCE.

In using malt extracts in various diseases of childhood, I have noticed that the subjects frequently lose weight and get quite thin. At first, I attributed this to the laxative action of such extracts as contain a little bran; but this was a mistake, as the loss of weight occurred in some cases where there had been no relaxation of the bowels, but where there was the greatest improvement in the general health. The children were manifestly stronger and heartier, though their body weight had decreased.

From this, I conclude that the action of malt extract does not stop at the transformation of starch into sugar, but that it assists in causing the complete oxidation of the food elements which is necessary for the elaboration of the highest types of animal tissues. The formation of fat is by no means a sign of the highest type of health, but, on the contrary, indicates imperfect digestion and a lower grade of tissue formation, from deficient oxidation. Hence, in the feeble state of convalescence from acute fevers, we often see a great development of fat, while the patient is conscious that neither the mental nor the physical strength are restored to the condition existing before the illness; and, particularly, the capacity for enduring fatigue, privations, etc., is lowered.

So, also, in some forms of chronic insanity, the rapid development of fat is a certain precursor of a speedy death.

Acting upon this thought, I began prescribing malt extracts in obesity. The treatment was limited to methods for securing the thorough digestion of food. Adequate mastication and insalivation were obtained by forbidding the use of liquids while eating. The daily consumption of beverages was limited to a single cup after each meal. No restriction was made as to the kind of food eaten, each patient consulting his own inclinations; but all were directed to leave the table as

soon as the appetite was satisfied; and no eating between meals was allowed.

Fat people love to drink freely, especially of ice water. They are apt to eat until a sense of repletion is felt, and they are fond of nibbling between meals.

Exercise before meals was recommended, and the hours for slumber were curtailed.

This plan avoids the dangerous plethora induced by the famous Banting system, and the discomfort entailed by any rigidly exclusive dietary regimen. The only rule calling for any exercise of will-power is that which limits the use of drinks. For some days it may be necessary to allow a little cracked ice; or a little fruit; but after the first week the deprivation is no longer felt. One patient informed me that by keeping a small lump of gum Arabic under his tongue all sense of thirst was avoided.

No medicine was given, except a full dose of malt extract before each meal.

The results of this method are the best I have ever obtained in the treatment of corpulence, while the regimen is the most agreeable to the patient, and hence the most likely to be efficiently carried out.

A lady from the interior of the State came to me for relief from corpulence, which had not existed more than a year. At her marriage (aged 20) she weighed 118 pounds. Eighteen months later, when her baby was three months old, she weighed 167 pounds. In the course of three months' treatment according to the system just detailed, she had reduced her weight to 132 pounds. As she felt perfectly well, I advised her not to attempt any further reduction, but to keep her weight near that figure, by resorting to the system whenever she began to grow too fat. The improvement in appearance, as well as the greater ease in getting about, consequent upon getting rid of forty-five pounds of useless fat, is something which must be experienced to be fully appreciated.

The only real difficulties in treating ladies for corpulence are in inducing them to take a proper amount of exercise, and to abstain from eating between meals.

For the first I lay down strict rules suited to the habits and pursuits of each individual. I must say that the success of the treatment depends largely on the skill with which such rules are adapted to the peculiar conditions of each case. The wise physician who ordered the king to play tennis in order that when heated the drugs contained in the handle of the bat would penetrate his system; and the Philadel-

phian who compelled his patient to walk five miles every morning before breakfast, to drink a glass of water from a certain spring, may both be imitated with advantage.

INNUTRITION OF CHILDREN.

Children fall into bad habits with a perversity which can only be accounted for by the doctrine of original sin. Even before the traditional nine days' attendance after the birth has elapsed, the babe has learned to sleep all day and lie awake at night; to lie quiet only while the nipple is in his mouth, and other habits equally objectionable.

As he grows older, from inheritance, from bad management, or from imitation, he begins to show peculiarities as to his habits of eating, which may exert a deleterious influence upon his whole future life. I have elsewhere expressed my views upon the importance of teaching children to eat fatty food. All these peculiarities are worthy of careful consideration by the family physician. "Only a habit," should not be the end of such consideration; but rather the prelude to the questions of "Why has this child this habit," "What would it lead to if unchecked," and "How can it be checked."

Very often we will find that the distaste which a child manifests towards a certain class of foods, is due to a natural or acquired inability to digest it; while peculiar fondness for special articles may be due to a need in the system for some principles contained in these substances. The craving of pregnant women for chalk, slate-pencils, etc., results from the need of lime for the bony framework of the growing child. One of my little patients was nursed several months while the mother was pregnant with another child. The second child was quite feeble; but as soon as it could express a wish, it craved any form of lime it could obtain. Chalk, tooth-powder, white-wash, earth from the garden, were devoured with avidity, long before it could walk. Acting on this, I gave it lime persistently for over a year, and the result was, that by the time the child had ceased to eat white-wash, etc., it had grown to be the most healthy and vigorous one in the family.

Of all forms of infantile indigestion, none are so common as that relating to starch. The majority of children prefer fruit and meat, and partake of vegetable food with reluctance. In these cases the good effects of malt extract are seen most plainly. It should be given before breakfast, with a bowl of oatmeal, wheaten or hominy grits. Three parts of oatmeal with one part of wheaten grits make a very pleasant dish. Whole wheat, not cracked, is valuable because it requires thorough mastication, and hence assists in teaching the child how to eat properly.

For the mid-day meal he should have a pudding of rice, sago, tapioca, farina or corn-starch, with the malt extract, at the beginning of the meal. This plan of commencing the dinner with the dessert will meet with the most unmitigated approval of the little ones.

For supper the malt extract may be given with bread and milk toast, crackers, zwieback, Indian mush, or a baked potato. Nearly all mothers fall into the mistake of adhering too long to a single dish. Oatmeal is an excellent food, but becomes very unpalatable when it appears on the table at every meal. The bill of fare can easily be so arranged that no article shall be served oftener than once a week. This affords a healthful variety, and relieves the housewife from the wearisome question, "What shall we have for breakfast?"

I was called to see a little girl, aged eight years. She was not sick, but languid, fretful, and so thin that every bone showed through her skin. The mother informed me that she ate nothing but fruit and meat: going without her meals rather than eat vegetable food. The mother was peculiar in her habits of eating, there being but few articles of which she partook. She had very imprudently encouraged the child in her fancies by declaring that she "was just like her," etc., etc.

Now, here was a necessity of providing for the proper digestion of farinaceous food, and of inducing the child to use it. For the first object, I ordered a cup of Malto-Cocoa to be given before each meal, with a slice of bread, or some other starchy food. For the second, I advised the parents to institute a little game, which I have often used in such cases. This consists in each person at the table taking a morsel of every form of food served at the meal, before helping themselves to what they preferred. Some amusing ceremony was improvised, that the children might be assured that it was really play. The result was completely successful. In a few weeks the child was taking her food Malto and Cocoa nicely, the mother was also learning to eat rationally, and the improvement in both was manifest to all.

### CONSUMPTION.

Malt extract has not replaced cod liver oil in the treatment of phthisis, but has won a place of its own.

During the Winter months, in the intervals when an exacerbation has spent its force, and the temperature has returned to the normal point, cod liver oil is of the greatest value. But in Summer; while fever is present; and in cases where cod liver oil is loathsome, GRANULATED MALT EXTRACT is its best substitute. Bearing in mind its two-fold action

as a nutrient and a digestant, it will be seen that even while cod liver oil is being administered, the malt may be used at the same time. In all cases where emaciation and indigestion of fats co-exist, a combination of an oleaginous food with malt extract is indicated. The emulsion of oil with malt is objectionable for two reasons. To most persons it is exceedingly disagreeable; the malt failing to disguise the odor or taste of the oil. Neither does it form a true emulsion, as the oil separates from the malt when the mixture is stirred into a cup of milk. Besides, the proper time to give malt extract, is before meals; while cod liver oil should be administered an hour after meals. This theoretical objection is found to be verified in practice.

The preparation known as Malto-Cocoa, consisting of GRANULATED MALT EXTRACT and powdered cocoa, which has been deprived of part of its fat by expression, fulfils the indication precisely. Children usually take oil readily; but when they do not, the pleasant drink made with Malto-Cocoa and milk answers well. Some persons prefer the molasses-like extract, but with the great majority the dry granulated extract, or Malto-Cocoa prove most palatable. In all cases, I have found the efficiency of the remedy depending largely on its acceptability to the palate.

To sum up, I would say that I have found the laxative extracts containing bran suitable for cases of intestinal torpor, with flatulence.

The non-laxative, liquid extracts, or the dry granulated extract, are best suited to the treatment of corpulence, indigestion of starch in adults, and all cases of wasting disease where fat is not desirable.

The combination of malt extract with cocoa is indicated in nearly all cases of consumption, in indigestion of starch in children, in wasting diseases of childhood, and in convalescence from acute fevers In fact, whenever we wish to give malt extract to children, this is the best preparation.

If the amount of fat contained in the cocoa should disagree with the stomach, a few grains of pancreatin should be added to each dose.

The industry of our pharmacists has given us an endless list of combinations of malt extract with other drugs; upon all of which I look with distrust, fearing that they encourage a habit of complex dosing. It would be better if we started with a simple malt extract, and directed the dispensing pharmacist to add such drugs as may be needed by each individual case. Instead of ordering "Ext. malt, with hypophosphites, pepsin, pancreatin, strychnia, phosphorus, iron,

quinia and bismuth," we should have an extract with which any pharmacist could mix as many grains of the pepsin we prefer, as we consider needful in the case before us.

LACTATION.

Nursing mothers frequently find the drain upon their blood for materials to supply the needs of the growing child too great for their strength. The weak condition resulting gives an opportunity for many diseases, like baleful weeds, to develop. Neuralgia, rheumatism and lingering catarrhs are particularly prone to attack the puerperal woman. Very often pulmonary consumption first shows itself during this period. It would seem that the powers of the cells, to resist the invasion of the omnipresent tubercle-bacillus, are weakened. Many mothers who find their strength unequal to the task, seek to keep up the supply of milk by the use of malt liquors. A glass of beer will be followed very quickly by a free secretion of milk, and the child's appetite will be appeased. But can this be milk of good quality? Some years since, the indignation of the whole community was aroused by the discovery that a large portion of their milk was supplied by cows fed on distillery grains, *i. e.*, swill-milk. What else is the mother's milk produced from beer? It cannot possibly have the nutritious value of a secretion derived from an abundant meal of nourishing food, properly digested. The effects of the food, however, are not felt for some hours, while that due to beer is manifested in a few minutes. As meat is more quickly and easily digested than vegetable food, nursing mothers fall into the habit of avoiding the latter. In this condition Malt Extract is of signal benefit. I prefer the granulated extract, with which I direct the apothecary to add three grains of lacto-phosphate of lime to each dose. Malto-Cocoa may be used if this becomes distasteful; and pepsin or pancretin added if indicated by difficulty in digesting albumen or fat respectively. If phthisis be actually present, or threatening, it is well to give the Malt Extract before meals and an emulsion of cod liver oil, with lime an hour after eating.

In the foregoing notes upon extract of malt, I desire it to be understood that I do not include Hoff's preparation. This article, containing a small amount of solid ingredients and appreciable percentage of alcohol, more nearly resembles the malt liquors, notably porter, and its therapeutical uses should be considered in connection with them. In lactation, its use is open to the same objections as those raised above to that of other malt liquors.

*1521 Arch Street.*

# MORPHOLOGY OF THE HUMAN SPUTUM (Partial List).

BY EPHRAIM CUTTER, M. D., NEW YORK.

1. Mucous corpuscles.
2. Mucous cells swarming with the moving spores, probably of the leptothrix buccalis; not found in the mouths of healthy infants.
3. Mucous corpuscles distended with crystalline and other bodies.
4. Epithelia ciliate and non-ciliate.
5. Spirillum.
6. Vibriones.
7. Micrococus spores.
8. Bacilli.
9. Spirulina splendens.
10. Gemiasma verdans and rubra.
11. Alcoholic and lactic acid alcoholic yeast.
12. Vinegar yeast and lactic acid vinegar yeast.
13. Mycelial filaments of vinegar and lactic acid yeasts.
14. Leptothrix buccalis spores and filaments.
15. Papillæ of tongue, usually infiltrated with spores of 14
16. Mucor malignans.
17. Hairs of plants and animals.
18. Vegetations found in croupal membranes.
19. Pus corpuscles.
20. Blood corpuscles, white and red.
21. Clots of blood.
22. Granular tubercular masses.
23. Elastic lung fibres.
24. Inelastic lung fibres.
25. Lumen of veins and arteries.
26. Carbonized tissue from lungs.
27. Partially carbonized vegetables tissues from smoke.
28. Oxalate of lime.
29. Uric acid crystals.
30. Cystine.
31. Phosphate of lime.
32. Triple phosphate.
33. Cholesterine.
34. Calculi, made up of one or more of 28, 29, 30, 31, 32, 33. These may all come under the appellation of "gravel of the lungs."
35. Other crystals whose names have not been made out.
36. Amorphous organic and inorganic matters, including dust and dirt inhaled from the atmosphere.
37. Portions of feathers of animals and insects.
38. Potato starch.
39. Wheat starch.
40. Elements of Animal food eaten, cooked and uncooked.
41. Elements of Vegetable food eaten, cooked and uncooked.
42. Cotton fibre.
43. Silk fibre.
44. Linen fibre.
45. Wool fibre.
46. Woody fibres, pitted ducts, etc.
47. Asthmatos ciliaris.

*213 West 34th Street, New York, Nov. 30, 1885.*

# EQUILIBRATION IN DISEASE.

By Romaine J. Curtiss, M. D.

[Professor of Hygiene in the College of Physicians and Surgeons, Chicago, Ill.]

LATE medical writers are bringing about a change in the classifications, terminalogies and science of the relations of medicine, as the subject is gradually being adjusted to the terms and laws of the philosophy of evolution. Until very lately the therapeutics of medicine (as a system) has had very little claims to be classed as a science; it being more or less a chaos of clinical observations, with little attempt at classification, of the clinical facts, or their verification; but the discovery of the cause of disease (zymotic), which has lately been made, has made medicine, as a system, capable of being classed as a science.

Most of our text-books were written before the philosophers had generalized from scientific observations, the modern scientific philosophy of evolution. Now that the general laws of this philosophy are known and established, the next great medical labor must be to readjust medicine and its fundamental sciences in accordance with these general laws. If the general laws of evolution are true, they certainly furnish the data for deductive inference in medicine; if the laws are true, they furnish an explanation for the phenomena of disease. If the phenomena of disease cannot be explained by them, then either the laws are not true, or else there is an error in the given clinical observation, or the clinical observation or fact is wrongly classified. The basis of physiology and of pathology, then, is found in the phenomena of "matter" and "motion," in their most general manifestations. "General pathology" can, of course, then, be reduced to its ultimate factors of the special manifestations of matter and motion, and, in order to be explained, scientifically, its relation to "continuity of motion," to "correlation of force," to the rhythm of force, and to equilibration of forces, etc., must be known and understood.

### EQUILIBRATION IN ITS GENERAL RELATION TO ORGANISMS.

The meaning of equilibration is the balance of forces. If forces are acting in opposite directions, or with any degree of opposition, and are not equal to each other, there will, of course, be a representative balance. The balance of force, with the "matter" that is correlative

with it, certainly underlies the phenomena of organisms, and accounts for the phenomena of disease as well. "Signs" and "Symptoms" are measures of equilibration, or represent resultants of the physiological and pathological forces. In relation to biology, in general, the general phenomena of life—growth, differentiation, segregation, redistribution, natural selection, adaptation, etc., etc., equilibration stands as the fundamental force, and its relation to these things has been schematically represented as follows:

Equilibration { External { Direct { Adaptation. / Indirect, . Natural Selection. } Internal { Direct { Heredity. / Correlation of Growth. / Indirect, . Use and Disuse.

As may be seen, at a glance, the general phenomena of life are the phenomena of equilibration. We cannot imagine what a world would be without antagonistic forces nor what it would be if the antagonizing forces were equally balanced in all their manifestations of rhythm, volume, correlation, etc., though I suppose "life" on the moon, or at least the moon's surface, comes as near this representation as anything our imagination is capable of. A moving equilibrium gives rise to the phenomena of life on a globe, but equilibrium at rest is death.

### EQUILIBRATION IN DISEASE.

I can do no more than hint at the outline of the relations of equilibration in disease in a short paper, but will mention this relation to the symptoms of disease, plus the drugs used in treatment; and also refer to equilibration in its relation to new pathological formation.

The action of the heat and the blood-vessels in health is very well understood. All men are more or less familiar with the phenomena as they are presented to the senses. There is a definite rhythm, a definite rate of pulsation, a varying blood pressure, which is as sensitive an index to the bodily forces as the thermometer and barometer are to the meteorological forces. But suppose the addition of a disease force, as the microbe of typhoid and its poison. The heart's action, then, varies from its usual action. If the normal rate is 80, and the rate now is 120, the difference is the equivalent of the new equilibrium of the forces of disease and those of physiology.

The body maintains a rather definite temperature, under very different internal and external conditions. The conditions and forces which are interchanged and correlated with each other, in order to

maintain this temperature equilibrium, are of the most complex character. But if the typhoid microbe is added to the economy of the organism, it produces a poison, which destroys this conservative equilibrium. The temperature rises. If in health, the temperature is $98\frac{5}{10}$° F., and in typhoid fever is 103°; the difference is the measure of the new balance of forces established by the antagonism of the poison of the micro-organism, and the complex forces, which govern the temperature equilibrium.

But typhoid fever is a disease that is "doctored" a great deal. Suppose that in a given case of typhoid, the pulse is 120, and the temperature 103°. In such a condition a drug is given, or two drugs—generally more—but say a dose of aconite and of antipyrine are given. All drugs, so far as I am informed, if they act on blood pressure, or heart's action, are paralyzers, of something. The aconite acts by paralyzing certain nerves—to a certain degree, of course, and by this action may slow the pulse. Eliminating the daily rhythm of pulse frequency, in typhoid, from this problem, after aconite is given, the change in the heart's action may be attributed to the drug; and the difference in frequency brought about, is the equivalent of the equilibration between the physiological forces and the disease forces, plus the aconite. The moving equilibrium, under this condition of things, may be represented by a change in the frequency of the pulse from 120 to 112. It is a very serious question, and a question which I will consider at a future time, whether this change from 120 to 112, in the frequency of the pulse, is a help to the microbe, or the disease, or the patient.

But the patient also gets a dose of antipyrine, which drug possibly acts to paralyze the "temperature centre" in the medulla, and the new resultant is a change of temperature from 103° to 100°. This difference of 3° is the equivalent of the new equilibrium in temperature, and represents the resultant of the physiological forces on one side, and the disease forces, plus the antipyrine on the other side.

It is also questionable, in view of the law of natural selection, whether this new equilibrium works a greater benefit to the patient than the microbe. It is at least noticeable that the practice of ten years ago, consisting in giving large doses of quinine in typhoid fever, is going out of date. As I propose to argue from the standpoint of natural selection, the too great interference with the symptoms of disease *may be* detrimental to the patient's recovery; as a support to this *a priori* argument, there are already whispers that quinine has killed not a few typhoid patients, or, to put it more mildly, the addition of the drug does not always move the equilibrium in the right direction.

New growth, as tubercle, cancer, etc., has a very definite character. The cells are always recognizable by their definite characters. If this proves anything, in relation to antecedents, it is that the antecedents of individual cancers and tubercles are similar in character—they are the same in each case. The germ theory settles this question by confirming the proposition, or the inference. The forces which form the tubercle cell are the physiological forces of the tissue, and the poison of a microbe. The tubercle cell is a modified tissue cell—modified in a very definite manner. The physiological forces make the tissue cell, but the modified tubercle cell is the product, represented in morphology, of the cell-making physiological forces and the microbic poison. The difference in form, shape, duration of life, and general usefulness of the tubercle cell as well, from the tissue cell, is the equivalent, represented by "matter," of the new equilibrium established between the forces of physiology on one side, and the poison of a disease on the other side. The formation of new growth in plants, as the gall-nut and ergot, represent the same character of change in equilibration.

These special references, in pathology and therapeutics, will suffice to indicate the outline of the meaning of equilibration in disease—a subject which lies below all such phenomena, and which must be called upon for their explanation.

*Joliet, Ill., Nov. 12, 1885.*

# OXYGEN: A RATIONAL STUDY OF ITS PLACE IN THERAPEUTICS.

By Samuel S. Wallian, A. M., M. D., Bloomingdale, N. Y.

THE time has come, in the history of medicine, when every therapeutic claim, every honest endeavor to abridge or ameliorate human suffering, add comfort to the days and length to the years of human life, is accorded a respectful hearing, and is finally judged on its absolute merits. This is true, even to the impartial and unprejudiced investigation of the scores of popular isms and ephemeral pathies which every decade brings frothing to the surface.

Throughout the medical world analysis, speculation and research are active and eager for new light. Routine methods and antiquated theories, which have only popular prestige and venerable antiquity to sustain them, are no longer competent to satisfy thinking minds. Our foremost writers, teachers and investigators have begun to insist on reasonable data for every assumption. They refuse longer to rest their medical faith on dogmatic assertion and time-honored tradition, insisting that medicine, mystery and superstition have long enough been in vogue as synonymous terms.

Heretofore the study of medicine has involved and required, chiefly, a process of memorization—cramming—and the cultivation of an aptitude for implicit belief. Now it requires that its devotees shall investigate, criticise and think.

Diseases are no longer looked upon and superstitiously dreaded as evil spirits, roaming at will over the face of the earth, seeking what luckless victims they may devour; and only the inexcusably ignorant still attempt to exorcise them by philters and mummery.

The one unremitting search of the day is for a key to the true nature of disease, and for remedies which do no violence to natural laws, which do not contravene physiological action by substituting one condition for another, and assuming that since it is a change it is a cure. Hence the imminent and irrepressible conflict in the medical field is not one of strained ethics, but lies between natural, as opposed to applied or artificial therapeutics. In these later days, every society meeting and medical congress brings to the front new knights to champion fresher ideas, and to pierce the armor of established errors, already everywhere losing deference and tottling to their fall.

In view of the chaotic incongruity of pseudo-science and the jargon of learned superstition, enshrined in all the text books, taught in all the schools and revered by a vast majority of the human race, we must needs ask what resource is left to the conscientious student of medicine who is unwilling to stay in the rut, to dole out, by set rule, the routine remedies, and to strive in vain to appease his scientific hungering with the husks of hypothesis?

We all realize how sadly we have limped in the race with the sister arts.

Astronomy has wrenched from the heavens their profoundest secrets, and brought to our view the remotest mysteries of chaotic space. In commerce and the industrial arts, progress and perfection are the order of the day. Space and time have been annihilated in the flash of the harnessed lightning; the electro-scientist now discounts the labor of the historian by treasuring and reproducing the very voices of the dead, and repeating the music of one age and generation in the ears of the next; microscopy has well-nigh revealed the original mystery of creative energy; law has a basis of system; theology boasts a definite plan; painting and sculpture are guided by fixed rules, and all the natural sciences have constantly advanced toward absolute precision and mathematical certainty; while the logical claims of assumed medical science are no more substantial and no less hypothetical than in the days of Paracelsian dogmatism and pompousness.

Medical skepticism of a rather healthy and conservative sort, is daily and yearly increasing, and standard text-books on materia medica and therapeutics are coming to be looked upon as indexed museums of medical curiosities. The list of reputed remedies ostensibly multiplies, but new claimants are received with incredulity, and the pharmacopœia is being so rapidly and mercilessly culled of its rubbish that even well-poised medical minds begin to query whether it will be long before the whole endless category of drug-medicines, with a few rare exceptions, will be unceremoniously kicked into the sea.

Yet, surrender what we will of art, even though all the arts become Lost Arts, yet nothing is lost. Every atomical integer of creation, ponderable or imponderable, solid or fluid, every law and force and attribute remains. When we substitute a fetich for a fact nothing is endangered.

So we may cherish an ideal instead, let the idols go. The sun, and moon, and stars, and earth, and air remain; more we never had.

For still abideth these three; earth, air, and water; but the greatest of these is *air*, for lo! it makes all the rest possible; is of

them and ever about them; and without it was not anything made that was made. This, is *Oxygen*, the primal source through which man became and continues to be a living soul; the kindly and sustaining medium in which he is forever bathed, at all times his inestimable friend, and at last his relentless destroyer; indispensable boon and unerring besom; blandest at once and most potent of all the forms of matter—the veritable *anima* of Stahl.

Wherefore the straws of logic and prophecy all point to this, as the ultimatum of physiology:

*From the same agencies and elements which nourish, encompass and sustain us, in health, must we at last seek remedies through which to recover lost physical status.*

In this direction what have we accomplished? Earth has been analyzed, volatilized, subtilized; dissociated, isolated, combined and recombined; and the apothecary's shelves groan with their labeled loads of it. Water has been utilized, abused and refused, in almost every form of human ailment. Its uses and availability are next to limitless, altogether indispensable, and not yet half appreciated.

Of oxygen as a commonplace medium of respiration, submersion and transmission, we have conned a few trite aphorisms. Of its resources for repair and restoration we go on, age after age, almost criminally ignorant. Not that it has not been studied in the light of a therapeutic agent, in the past, to some extent, but that stilted misconceptions of its normal effects have been permitted to blind us to its real capabilities, and to keep it for a full century in the background.

As early as 1772, Marching Poullé, of Montpellier, and in 1774, Girtanner and Stoll, of Germany, attempted the use of oxygen gas in the treatment of diseases, with what results does not appear. The first reported case, of which any definite record remains, in which this agent was used, was treated by Caillens, in 1783. In the following year, Jurine, of Geneva, published a short essay on the subject, and reported a case of phthisis in a young lady, very much benefited by oxygen.

The next record is by Chaptal, of Montpellier, who, in 1789, reported two cases of phthisis, treated by the same agent, in one of which marked relief was obtained, while in the other the results were negative.

To Beddoes, more than to any other, belongs the credit of having called the attention of the profession in England to the medical use of the gas. His experiments were conducted on an extensive scale and with a perseverance and enthusiasm worthy of a more practical success and better recognition than he secured.

For a history, in detail, of these and later experiments consult a prize essay read before the Alumni Association of the College of Physicians and Surgeons, New York, 1870, by Dr. A. H. Smith.

Other names occurring in connection with early experiments with the gas as a remedy, are those of Priestley, its co-discoverer, Lavoisier, Barthollet, Spallanzani, Thornton, Hill, Cavallo, Erichsen, Demarquay, and others. Sir Humphry Davy also materially assisted Beddoes in his chemical manipulations. The latter was a practitioner of note, and also professor of chemistry at Oxford.

Considering the extremely crude state of chemical knowledge prevailing, at the time, it is fairly remarkable that any encouraging results were attained. To illustrate, Beddoes and his confrères procured their gas from an oxide of mercury, through what would now be deemed a crude and bungling process. The purification of the gas was so imperfectly accomplished that in some instances ptyalism ensued, and the treatment had to be suspended to prevent mercurial poisoning!

The methods of exhibiting the remedy were also very imperfect, the patients being caused to remain for some time in closed rooms, the atmosphere of which had been previously impregnated with the desired gas. Thus the sufferer was caused to sit in and inhale an atmosphere, which, already tainted by an impure gas, was being constantly further contaminated by his own, perhaps fetid, exhalations, and having no way by which it could be definitely regulated or renewed.

Among the gases tried, both by inhalation and by cutaneous absorption—gas-baths—were oxygen, hydrogen, nitrogen, carbonic acid, nitrous oxide, and some others.

After the discovery of the peroxide of hydrogen, in 1818, by Thenard, this member of the oxygen group was added to the list for experimental test in medicine. Of all the agents tried, none gave promise of positive remedial value, except oxygen, nitrous oxide and the peroxide of hydrogen.

Like all new agencies when first announced, oxygen was overlauded in the outset, the reports of cures effected partaking so largely of the marvellous as to be generally discredited. By its few advocates it was extolled as a panacea for all the ills of humanity; while the many passed it by as only the newest candidate for ephemeral fame. Distrust of the agent and derision of its manipulators were alike universal and utterly unreasonable.

But this was in nowise an exceptional experience. All the natural, and therefore common agencies, when urged in therapeutics, have

met with a similar reception and failed of better recognition. Hydrotherapy and Galvanism have waited half a century to be lifted out of the domain of quackery (where they never belonged), and are not yet universally admitted into the guarded circle of legitimate therapeutics. It would seem that the human mind—even the medical mind!—is sometimes inclined to value aid chiefly in proportion to its far-fetched unnaturalness.

The influence of diet over development, as well as in the causation and removal of disease, is yet but half known; and who is not tired of the movement-cure-gymnastic-health-lift-jolting-chair din? Even dumb-bells have had to be made "electric" in order to prop them in popular favor.

So of oxygen. It is too common. Do we not breathe it all the time, and is it not everywhere, in unvarying proportions, in spite of us? Yet who of our astute investigators, gloating over each new tint for staining a possible bacillus, and strutting in the prints if he have brought out a new glucoside, has given to the study of oxygen a tithe of the time he has spent in bothering about spectral polarization, or the proper method of eneucleating the dislocated vitreous of some pink-eyed rabbit or sniveling guinea pig!

Of the process of respiration, we barely remember to have been told that when the average man takes a full inspiration, he has distended his lungs with about 175 cubic inches of atmospheric air, consisting of about 140 parts nitrogen, and 35 of oxygen. Something the books add, in a dogmatic way, about chemical blood-changes, the burning up of nitrogenous waste, and the conversion of hydro-carbons into heat. Thus, oxygen, that sole element in which all other elements, even diamond itself, are consumed with fervent heat, the essential principle of all life, is degraded into a mere mechanical motor—the steam generator of the vital organism!

Looking more closely into the nature and composition of this theoretically tasteless, odorless and impalpable fluid, it is now conceded that the oxygen of the atmosphere, its atoms pushed asunder and probably modified by the interposed nitrogen, exists in a peculiarly quiescent state: that the atmosphere at all times contains appreciable quantities of aqueous vapor, carbonic acid and ammonia, also traces of ozone and peroxide of hydrogen, the two latter being frequently confounded and mistaken, one for the other.

These may be termed normal, since they are almost constant constituents of respirable air. Some of them vary greatly in proportion, in

different localities; and it is chiefly these variations which render one locality or climate more or less salubrious and invigorating than another.

In addition to these, either useful or practically harmless, constituents, we must also make allowance for numerous accidental or factitious impurities—dust, animal emanations, noxious gases from decomposing matter, from manufactories and chemical workshops, smoke, and in the present temper of microscopic pathology, especially must we concede importance, as ætiological factors in the causation of certain classes of diseases, to floating germs, spores, and a certain invisible and elusive something, the practical sequel of which is contagium.

Estimating that the average adult, in ordinary health breathes twenty times per minute, and that 100 cubic inches of air is inspired at each effort, it will require, in round numbers, 12,500 gallons of air to supply each pair of lungs during twenty-four hours. Of this quantity, 2,500 gallons is oxygen. Omitting all consideration of the neutral diluent, nitrogen, as having—possibly—no practical bearing, it thus requires 100 gallons of pure oxygen, per hour, to maintain a human adult organism in healthy relations.

Considering the thousand-and-one sources of contamination, the interference of occupations necessitating cramped bodily positions, unavoidable climatic vicissitudes, noxious local surroundings, the impossibility of perfect ventilation, even in our most elaborate dwellings, the confining character of the daily occupations to which a majority of the race must submit, thus making it utterly impossible to secure anything like normal air to breathe, it is safe to assume that the average actual consumption of oxygen is not more than one-half this estimated requirement. It follows that the pathologist who attributes a majority of all modern diseases to a veritable *anhæmatosis*, or, in plainer phraseology, semi-asphyxia, has fact, physiology and logic all contributing to sustain his assumption.

Human beings, therefore, especially in civilized life—the ratio alas! increasing exactly in proportion to the degree of civilization—either voluntarily submit to or are compelled by circumstances over which they have little or no control, to suffer vital robbery to this extent. True, Nature, ever on the alert for compensatory substitutes and conservative reparation, does her best in many ways to render this deprivation comparatively harmless; but as constant trickling finally splits in twain mountains of adamant, so this physiologic deprivation so steadily persisted in day by day, at last makes its inroads. The starved blood

falters, the robbed nerves cry out, tissue changes flag for want of material, or the tissues themselves degenerate, until disorganization in one or another of its fatal forms, is finally inaugurated. Anæmia, neuralgia, dyspepsia, diabetes, albuminuria, scrofula, tuberculosis—these are the milestones on the downward road, the direct or indirect results of imperfect oxygenation, the *misère physiologique* of Bouchardat.

It may be asked, does not this ignore the prevailing germ theory as relates to the ætiology of certain diseases? Not at all. Pasteur and others have taught us that the bacillus of anthrax, as well as other germs, are soon robbed of their virulence by cultivation in fluids freely exposed to the oxygen of the air; and that while they are not strictly anærobic, anything more than a very limited supply of oxygen cripples and eventually kills them. In other words, the origin and multiplication of these germs is made possible only through definite *deprivation of oxygen*, and thorough oxygenation transmutes a favorable culture fluid into a lethiferous menstruum.

But to touch on another point, as yet scarcely hinted. Dr. Birch, of the Manchester Medical School, who published an interesting work on the subject in 1858, asserted that oxygen as evolved by chemic art is in a *nascent*, allotropic or *actinic* state, and hence, in its degree of activity, quite distinct from the quiescent oxygen of the common atmosphere. Whether this be due to minute traces of ozone, always present in factitious oxygen, or to some occult molecular differential too subtle to be detected, not to say described, cannot now be determined. Fifteen years of clinical experimentation has fully convinced me of the truth of this assumption; but I cannot appreciate the further vagaries as to "polarization," "motive power," "heat," etc., indulged in by the same author.

It is, then, futile to reason of the potency of oxygen set free in the alembic of the chemist by the action of that found in common air.

Those who have watched the prompt and delicate effects of nascent chloride of ammonium, as evolved in a cloud of microscopic snow crystals, through a properly prepared inhaler (say Cutter's), as compared with the old and crude method of heating the salt to vaporization over a common lamp, are fully prepared to appreciate this statement. It is, in a word, actinic oxygen, akin to, if not always combined with, ozone.

It proves itself a prompt parasiticide, a powerful disinfectant and deodorizer. Very few forms of microzoic life can withstand it, for, like its *alter ego*, ozone, it is not only a potent germicide, but is also a reliable sporicide. All material substances, all forms of organic matter

permeable to any form of contamination, infection or contagium, are alike permeable to oxygen. The latter unerringly seeks out morbific germs, and robs them of their virulence, or mercilessly strangles them ere they have had time to colonize, multiply and initiate destructive processes or accomplish fatal lesions in any fostering nidus.

Is it then wonderful that in this element so common as to be almost vulgar, we have, if we know how to adapt it, one of our most potent weapons in the warfare upon disease, and especially in combating all that large and important class of chronic ailments, which are a direct result of its own chronic, physiologic insufficiency?

The whole vexed subject of climatology resolves itself into a study of atmospheres; and these are good, bad or indifferent exactly in proportion as they afford the vital element in question, free from contaminations, *or as they contain traces of ozone, or peroxide of hydrogen.*

In passing upon any climate or locality, either as a desirable place of residence or as a resort for invalids, the first question to be decided is whether the atmosphere is comparatively free from hurtful emanations, "malaria," noisome odors, floating germs or injurious vapors. The next question should be to determine the appreciable presence or marked absence of these essentials, modifying but generally ignored constituents which vary greatly as to quantity at different times and in different localities.

The rush to Europe, the numerous watering places, and the mountains, is essentially an unconscious hunt for more oxygen, or for less contaminated and more available oxygen.

The sea voyage is another search for oxygen—ozone, uncontaminated air. What is there in the brackish salts held in solution by seawater to be of service to the debilitated invalid? One can easily fabricate more agreeable and really more beneficial mixtures on land. The bracing sniff of salt sea breeze, so celebrated in poetry, is merely a grateful sniff of purer air tinctured with revivifying traces of peroxide of hydrogen and ozone—*oxygen.*

It is not the aim of this paper to elucidate details of methods, or to give reports of cases treated, and results accomplished. This has been done in previous papers read before medical societies and published in various medical journals, chiefly the *Medical Record*, some of which have been issued as reprints; to these the interested reader is referred for *pro forma* evidence.

In the publications referred to, some illustrations are given of simple and limited apparatus, for office use, in preparing and dispensing the gases.

As the treatment is evidently on the threshold of an active revival, *and soon to be rescued from the custody of mercenary quacks,* a more elaborate arrangement, for general office use, has come into demand. The accompanying sketch illustrates the writer's model of a four-meter cabinet, with compact laboratory combined, for general office use. The form may be varied to suit the needs and convenience of each practitioner. It may be made highly ornamental or comparatively inexpensive, according to taste and means. Curtains of any suitable material, if desired, are to be suspended by sliding rings over a bar at the top, so that the whole may be neatly enclosed when not in use. They are omitted in the cut in order better to illustrate the working parts.

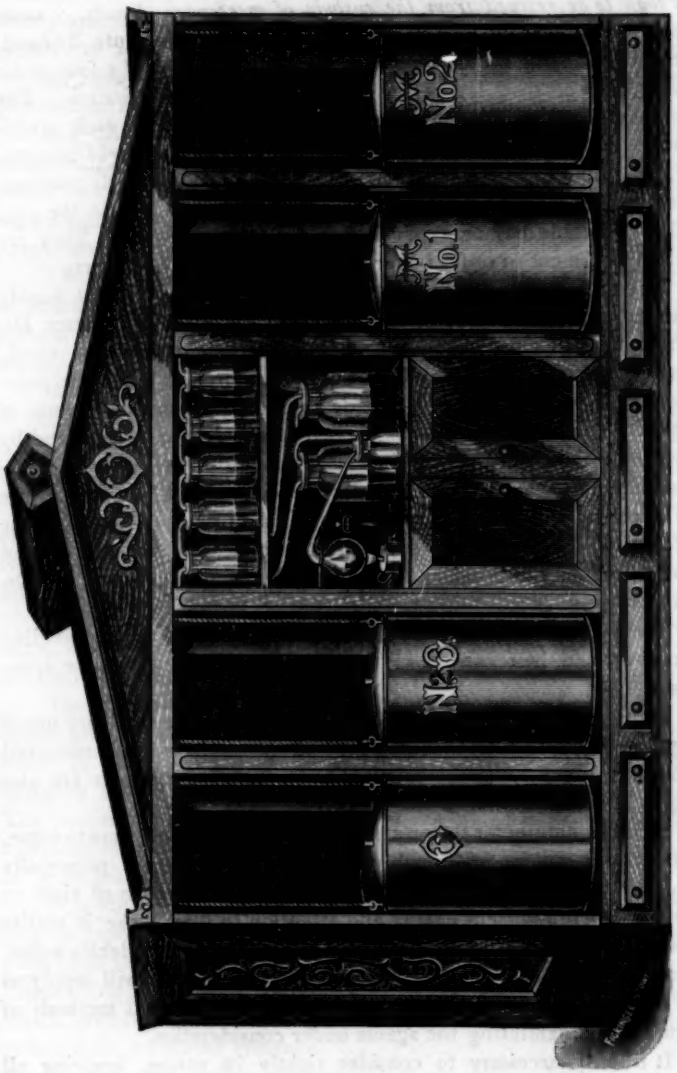
The principle of pneumatic differentiation, lately brought freshly to notice by Dr. Williams, of Brooklyn, Dr. Bowditch, of Boston, Dr. Houghton, of Chicago, and others, benefit their patients as much, perhaps, by the increased quantity of oxygen insured as by the mechanical effects induced. It can be made a valuable adjunct in the use of oxygen. The latter may be compressed to any degree desired, and by very simple and comparatively inexpensive additions to the usual apparatus, patients may be caused to inspire compressed gas, and expire into a partially exhausted receiver. Thus the principal effects of the differentiation treatment can be, at least in a measure, secured without recourse to the cumbersome and expensive chamber required for Dr. Williams' process.

The pressure-ratio between the fluid inspired and the surrounding atmosphere can be regulated without recourse to very expensive apparatus.

Plans for combining this idea with that of the ordinary use of oxygen, etc., are now being developed and the results will be announced in the near future. Various unique designs for office cabinets are also being perfected.

From its nature, for the present, and perhaps for some time to come, the treatment will unquestionably and necessarily remain principally in the hands of the few practitioners who will, regardless of time or expense, devote sufficient energy and attention to it to make it realize the widest success of which it is capable. The day will evidently come, although yet far off, when our manufacturing chemists will supply us with some easier, less cumbersome and more economical methods of procuring and exhibiting the agents under consideration.

It is only necessary to consider rightly its nature, ignoring all specious claims and enthusiastic over-coloring, in order to infer the wide range of adaptability and applicability of the treatment. Without




Four Meter Oxygen Cabinet For Office Use.—Author's Design.

exaggeration, it is almost unlimited. Oxygenation is as essential to life and health as alimentation. No sane therapeutist asks, in what conditions and diseases is it proper to nourish his patient! And super-oxygenation is as logically and naturally indicated—fairly in fact, self-suggesting—to overcome the diseases which result from deficient oxygenation, as alimentation to revive and restore the starved survivors of the Greely Expedition! This rule or indication is simple and definite, and covers the subject better than pages of hypothesis, or whole volumes of pathological finesse.

While its range is practically unlimited, the fields in which greatest triumphs have thus far been achieved are in the direction of *the indigestions, asthma, phthisis, tubercular and fatty degenerations* of every kind, *neuralgia, neurasthenia, anæmia, insomnia, scrofula, glandular enlargements,* and, in short, in all chronic diseases dependent on *deficient, perverted or morbid assimilation.* Thus, among the many inveterate forms already made to succumb, or decidedly ameliorated by the treatment, may be named, in particular, *epilepsy, eczema, phthisis,* both fibroid and catarrhal, *locomotor ataxia, sciatica, chronic pelvic cellulitis,* with intra-pelvic abscess, *cardiac troubles* of various kinds, severe *chronic constipation, insomnia* and *impotence.*

The time required for definite and satisfactory results necessarily depends on the nature and age of the cases. The curative process is not always attended by brilliant immediate results, but is often quite slowly inaugurated. It is, however, usually so thorough and permanent that in the end there is no complaint on this score. Hence, chronic cases should be treated by the month or term, while no desultory "trying it for a week or two" should be encouraged or tolerated.

A marked feature in many cases is that, after a course of systematic oxygen treatment, the benefits realized perceptibly continue, as if seemingly cumulative, long after active treatment has been suspended. Patients have thus been observed to *gain as steadily for three or six months after omitting the treatment* as while regularly following it.

It must be observed, and the fact should be emphasized, that this remedy or group of remedies, which includes several oxygen congeners, themselves efficient and important synergists to oxygen itself—is not urged as a panacea. It should be made no more prominent than it evidently is by virtue of its own nature, viz., the most potent and available of all the natural and thoroughly scientific agencies for the removal of diseased conditions. And yet in connection with it no rational or available adjuvant is to be neglected. Leave exclusivism to the charlatans.

This element, oxygen, at once so wonderful and so indispensable to every organized being, yet so common as to be the least appreciated of all the elements, has been much studied by scientists as to its chemical and mechanical significance, and also to some extent, as to its physiological relations; but it is only quite recently that any considerable interest has been revived in its evidently immense value as a therapeutic agent. In this respect American genius, for a wonder, has lagged, and allowed French, English, German and even Italian and Russian enterprise to take the lead in a study which is neither abstruse nor uninteresting.

Among others, the following authorities and fugitive papers may be cited:

Birch, "On Oxygen," London, 1858; Demarquay, "Reports to the Academy of Medicine," Paris, 1863; Idem, "*Gazette Medicale*," Paris, 1865; Smith, A. H., "Oxygen Gas as a Remedy in Disease," Prize Essay, New York, 1870; Laudolt "On the Use of Peroxide of Hydrogen in Ophthalmic Practice," London *Med. Record*, March, 1883; by the writer, "Oxygen and Some of Its Compounds as Therapeutic Agents," *Med. Record*, N. Y., 1883, vol. 24, pp. 455–457, and pp. 513–515; and by the same, "On the Preparation and Use of Oxygen and Congeners as Remedial Agents," *Med. Record*, N. Y., 1884, vol. 26, pp. 283–287; and pp. 313–316 Nunn, R. J., "Peroxide of Hydrogen in Diphtheria," Savannah, Ga., 1884; by the writer, "An Old Remedy Revived," Transactions Vermont State Medical Society, Montpelier, 1884; Idem, "Hydrogen Dioxide," paper read before the New York State Medical Society, February, 1885; Dayton, W. A., "Peroxide of Hydrogen in Purulent Otitis," etc., *N. Y. Med. Journal*, April 28, 1885; and by the writer, "Further Report on Oxygen as a Therapeutic Agent," *Med. Record*, N. Y. October 31, 1885 vol. 28, pp. 483–488.

# STATE REGULATION OF THE PRACTISE OF MEDICINE.

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[President State Board of Medical Examiners of Virginia.]

WITHIN the past five or six years, the subject of State regulation of the practise of medicine has been receiving much attention, and twenty-nine States have at present some law on their statute books on the subject.

I propose in the present paper to consider:

1. The desirability of such laws.

2. The nature of the laws now in operation in the different States, and the effect produced by them.

3. The objections which have been urged to the enactment of such laws.

4. The provisions which such laws should contain to make them effective and useful.

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*1.* The desirability of regulation of the practise of medicine by the State.

It will not be denied by anyone that it is the duty of the State to take care of the lives of its citizens; the existence of criminal laws in every civilized country on the face of the globe bears ample testimony to the universality of this conviction.

It follows, therefore, that if the lives of its citizens are endangered by the practise of the healing art by incompetent persons, it is the duty of the State to prevent such persons from practising. It is only necessary, therefore, to inquire whether the persons offering for the practise of medicine are competent or incompetent.

According to the Sixth Annual Report of the Illinois State Board of Health, there were, in 1883, 116 medical colleges in the United States. Of this number, a very small portion is endowed. There must, therefore, in the nature of things, be, in some cases at least, considerable competition to draw students, and so long as a college diploma entitles its possessor to practise medicine, just so long will the vast majority of students go to that college where a diploma can be had with the least expenditure of labor and money. It has been urged recently, in some

of the "secular" newspapers, that it is to the interest of the colleges, to fix their standard at a high point, so that their students would do them credit, but such a view is certainly erroneous in this money-loving and busy age.

It is unnecessary, however, to lay any great stress on this general reasoning. Facts—the hard facts so lauded by the practical Mr. Gradgrind, are not wanting to show how meagre are the attainments of some of the graduates of respectable schools. There have thus far appeared before the State Board of Medical Examiners of Virginia thirty-nine (39) applicants, all but two of whom were graduates of respectable colleges, colleges whose diplomas are recognized by the different State Boards, who are required by their State laws to recognize diplomas. Eight of the thirty-nine candidates were rejected, and a few extracts from their examination papers will show the extent of their information.

Before giving extracts from these papers, however, it is proper that I should state that these thirty-nine candidates were educated at different colleges in different sections of the United States. Nothing is farther from my purpose than to cast reflections upon any particular school in the present paper.

There would seem to be some ground for the belief that the training in the academic colleges is not so thorough as it might be. One young gentleman, who I am informed graduated with honor at a well known Eastern college, thus describes "aluminum, its physical properties, medicinal salts and their uses"—"aluminum is a very rare metal, and I think serves a more useful purpose in the composition of bell metal than as an article of the materia medica. The sulphate is used in medicine." In response to the written request that he would give the process for the manufacture of sulphuric acid from bisulphuret of iron, he says: "Sulphur dioxide + water + oxygen = sulphuric acid; $SO_2 + H_2O + O = H_2SO_4$." This is all, except a note in which he innocently remarks, "a different process from the one specified."

Another young gentleman, who is a graduate of a college which boasts having a very large attendance of medical students, wrote, in reply to a question as to the chemical name for common salt "bicarbonate of soda." Chemistry, however, has so little attention paid to it even in name, that I shall pass it by and proceed to other branches of more practical import.

The following answer was given by a graduate of a college in excellent standing, when asked to describe the portal system of veins.

"From the lacteals into portal vein, hepatic vein, vena cava ascendus, into right auricle," etc. The same young gentleman, when asked to describe the "cranial nerves, their number, mode of exit and function," stated that the fifth, trifacial, passed out at the styloid foramen, was exclusively motor in function, and supplied the muscles of mastication and deglutition; the facial nerve he agreed (with Willis) to divide into two portions, the portio dura and portio mollis, but he differed with that illustrious anatomist, by stating that the two nerves pass out of the cranium through the jugular foramen and supply the face and teeth with motion and sensation. He next accomplished the wondrous feat of inducing the glosso-pharyngeal, pneumogastric and spinal accessory to pass out of the cranium through the sphenoidal fissure, and the hypoglossal through the jugular foramen, and gracefully finished up the theoretical branches of the medical sciences by locating the centres for *will, memory, consciousness* and *emotion* in the *spinal marrow.*

Dr. Oliver Wendell Holmes, in his charming poem read before the Society for Medical Improvement in Boston, many years ago, spoke of Craniotomy as—

> "A trivial damage, since so oft we find,
> That babes grow up, who left their brains behind."

So much for the so-called "theoretical" branches of medicine.

Coming now to the practical side, we find one young man describing the treatment of diphtheria in the following terse language: "Belladonna, argenti nitras, aqua calcis and prophylactics."

Another advises that in treating a case of cholera morbus, the pain be first relieved and the irritant be then removed *by the stomach pump.* This young man stood very high at his college.

A third candidate described apoplexy as "a congestion of the brain coming on at different times."

In surgery, some striking answers were given. In response to a question as to the causes of hip joint diseases, we were told by one young man: "Taking cold sitting on the damp ground; sitting on the bank of rivers fishing."

The diagnosis of inguinal hernia was thus described by a man who had been a teacher (not in Virginia, I am thankful to say), and who stood extremely well at his college. I use his own language: "First you see a bulk and it feels soft; you suspition hernia; try to reduce it, and if it has not been down long it will go back; if it does, your diagnosis is certain curect; you know it is not a swollen lymphatic by its softness and position."

Perhaps the most striking answer received, however, was in response to the request for a description of the mode of ligating the subclavian artery, which was as follows: "The patient should be kept quiet and watched clost."

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It will doubtless be thought that these extracts are merely the worst specimens of the answers which were received, but this is not the case, except with reference to the novel mode of ligating the subclavian artery. They give a fair idea of the character of the papers of the eight young men who were rejected by the Medical Examining Board of Virginia, and who, but for the regulation of the practise in this State by the State, would now be practitioners of medicine and beyond the reach of the law.

Now, by reference to the tables prepared by Dr. Rauch, of Illinois, who deserves the thanks of all who are interested in raising the standard of medical education, for his untiring zeal in this direction, I find that the colleges represented before our Virginia Board by the thirty-seven applicants, who were graduates, had, in the aggregate, in the years 1882–83, 2,491 students, of whom 817 graduated. Now, if of the thirty-seven who came before our Board, six were rejected (I leave out the *non*-graduates), it is plain that, supposing the thirty-seven were fair specimens of the whole number, 132 of the 817 graduates were incompetent to practise medicine, or would, at least, have been considered incompetent by the Virginia Board, which, I do not think, would be considered extravagant in its demands. But there were in all, in the year 1882–83, 4,192 graduates in medicine in the United States, and if we again suppose that the Virginia graduates were fair specimens, we find that 679 of the 4,192 were incompetent.

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2. The nature of the laws now in operation in the different States, and the effect produced by them.

As stated at the commencement of this article, twenty-nine States and Territories have enacted laws regulating the practise of medicine. But there is great diversity in the nature of these laws, and, consequently, in their efficiency.

In five of the twenty-nine States, diplomas are not recognized as an evidence of competency, and all persons, whether graduates or not, are subjected to an examination. These five States are Alabama, Arkansas, Mississippi, North Carolina and Virginia. In the other twenty-four States diplomas are recognized as an evidence of fitness to practise

medicine. These are Arizona, California, Colorado, Delaware, Florida, Illinois, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, Ohio, Pennsylvania, South Carolina, Texas, Vermont, West Virginia, and Wyoming.

In the five States which do not recognize diplomas, there is considerable difference in the mode of appointment of the Examining Boards, and in the examination of applicants for practise. In Alabama and Mississippi, there is a Board of Examiners in each county appointed by the *County* Medical Society, and also, a State Board appointed by the *State* Medical Society. The County Board of Medical Examiners examines all candidates for practise who are *graduates;* the State Board examines only *non-graduates.*

In the Arkansas statute, there are two very objectionable features: the first is that the Examining Boards, of which there is one in each county, are appointed by the county judges; the second is, that rejected candidates can go from one county to another till they find a Board which will pass them. In North Carolina, which was, I believe, the first State in the Union to pass a law regulating the practise of medicine, there was, until a year ago, a fatal defect in the law, namely: there was no penalty attached in case a person violated the statute and practised medicine without having passed a satisfactory examination. This has now been corrected, and North Carolina has probably the best law, in most respects, which has yet been devised. That the law is efficient and *necessary* is shown by the fact that at a recent meeting of their State Examining Board, of fifty-three applicants who presented themselves, eleven were rejected and seven were allowed to withdraw, which was probably equivalent to rejection.

The members of the North Carolina Board, seven in number, are appointed by the State Medical Society, unless the Legislature chooses to claim the right to appoint. The Board meets at least once a year. Any two members may issue a temporary license, which is valid until the next regular meeting of the Board.

In Virginia, the State Board of Medical Examiners consists of three members from each Congressional District, and two from the state at large (thirty-two in all), who are nominated by the State Medical Society and appointed by the Governor every four years. Every person who desires to commence the practise of medicine in Virginia, and who has never been assessed with a license tax as a physician at any time prior to January 1, 1885, is required to pass a satisfactory

examination before the State Board of Examiners in session, or any three individual members thereof whom the candidate may prefer. The result is reported to the President of the Board, who issues the certificate, or notifies the candidate of his rejection, as the case may be. A rejected applicant cannot stand another examination prior to the expiration of three months.

I am informed by members of the Boards of Alabama and Mississippi, that their laws have had a most salutary effect in repressing ignorance and quackery.

In Arkansas, the usefulness of the law is greatly impaired from causes which have already been mentioned.

In North Carolina and Virginia, the result thus far is most encouraging.

I shall not refer to the effect of the laws in those States where diplomas are recognized, except to say that while much good has been done by refusing licenses to the graduates of notoriously disreputable colleges, the facts which I have adduced in an earlier part of this paper, show how little dependence can be put in the diplomas of many reputable colleges as a test of competency. Our brethren in New York and Pennsylvania,* where such laws are in force, have become so convinced of this fact that strenuous efforts are being made in both of those States to procure the enactment of laws which would require ALL applicants for practice to stand a State examination, whether they have diplomas or not.

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3. The objections which have been urged to the enactment of laws regulating the practise of medicine.

That those who were unable to pass a satisfactory examination would find very serious objections to the regulation of the practise of medicine by the State, might reasonably be expected.

Several objections have been urged, but only one has been considered of sufficient force to be introduced into the courts; this is the constitutionality or rather the *un*constitutionality of such laws. It is claimed by opponents of State regulation of the practise of medicine that such laws are unconstitutional, because they interfere with the choice of a vocation in life, and restrict that liberty which is guaranteed

* The University of Pennsylvania has recently decided not to endorse *any* diploma until the person holding such diploma shall have passed a satisfactory examination before the Medical Faculty of its own School on Chemistry, Anatomy, Physiology, Materia Medica and Therapeutics, Pathology and Morbid Anatomy, Practice of Medicine, Surgery and Obstetrics.

to all citizens of the United States. This point has been tested a number of times, and in every instance (save one, possibly,) the constitutionality of such laws has been affirmed by the Courts.

A second objection, which has been repeatedly urged, is that examinations, which would be fair and just for allopathists, would be altogether unjust if given to our homœopathic brethren, or, on the other hand, if examinations were conducted only on those branches in which the two schools agree, they would not be a fair test of the fitness for practice of applicants from either.

This objection is more apparent than real. The only difference between the two schools is in materia medica and the application of remedies. On Chemistry, Anatomy, Physiology, Hygiene, Obstetrics, and on that part of Practise and Surgery, embraced under the heads Causation, Pathology, Symptomotology and Diagnosis, as well as Operative Surgery, we think alike; and it is hardly conceivable that a man who could pass a good examination on all of these branches and subdivisions, could be dangerously *ignorant* in the matter of treatment; certainly not more so than many of the graduates of our own schools. Within the past week, a young homœopathic physician has been examined by three members of the State Board of Medical Examiners of Virginia, and licensed without the slightest hesitation. No questions were asked this young gentleman on Materia Medica and Therapeutics, but he was required to stand a written examination on Chemistry, Anatomy, Physiology, Hygiene, Obstetrics, and was furthermore required to state (in writing) the causation of four diseases, the pathology of four, the symptomotology of four, and the diagnosis of four, under both Practise and Surgery, and to describe besides four surgical operations. (The diseases described were selected by the examiners, not by the applicant.)

In any State, however, where there was a considerable proportion of homœopathic physicians, it would seem to be but just that they should have representation on the Board of Examiners; for it would be unreasonable to expect persons who had not a medical education (and but few of our Legislators have) to have a very clear knowledge of the difference between the two schools and of the absurdity of the "high potencies." But what is of far more importance, it cannot be denied that many of our homœopathic brethren are just as well educated in medical matters as we are, and that the differences between the two schools are growing less daily. There should, however, be *but one* Board; for if the allopathists and homœopathists had *separate* Boards, a desire on the part of each to increase the numbers of their school *might* lead to the licensing by one or the other of incompetent men.

Indeed, this charge has been made in California—with what truth I do not know.

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4. Finally, it may be well to consider very briefly what should be the provisions of a law to regulate the practice of medicine. Of course, there will of necessity be much difference of opinion on these matters, and any discussion of such points may seem almost trivial to those who have not had some experience with such laws; but our experience in Virginia has shown us the defects in our own statute and has enabled us to form clearer ideas as to what such statutes should be.

In the first place, it will, I think, be conceded very generally, that it would be far better to require some educational qualifications other than medical. A knowledge of Latin and of the principles of physics would materially aid the medical student in his strictly professional studies, but it would be difficult to persuade the average layman that a doctor who understands something of these subjects is any better qualified to administer a dose of vermifuge or set a broken leg.

A second point, which has already been considered quite fully, and which I shall therefore only mention here, is that a *diploma* should *not* be considered an evidence of competency to practise medicine.

Thirdly, the Board of Examiners should have no connection with any teaching body. I know that there is a wide difference of opinion on this point, but no one will deny that as a rule, teachers of medicine are better qualified to examine applicants than those who are not teachers, aside from the prejudices which might (unconsciously, of course), influence an examiner for or against the students of his own or other colleges. It is certain that the graduate of a college which was not represented on the Examining Board, would feel that he had not been treated fairly, were he rejected.

Fourthly, the members of the Board should be appointed or nominated at least, by physicians, not by persons who could not reasonably be expected to judge of a physician's qualifications. An advantage of this would be that the appointments would be kept out of politics.

Fifthly, all rejected applicants should be required to wait a reasonable time before being allowed to stand another examination.

Sixthly, all examinations should be conducted in writing and the papers should be preserved, for a time at least, so that in case an applicant claims that his examination was unfair, the statement may be disproved.